COPY

AIR FORCE

AD-A220 375

DTIC
ELECTE
APR 11 1990
D

HUMAN RESOURCES

ANNOTATED BIBLIOGRAPHY OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) VALIDITY STUDIES

John R. Welsh, Jr.
Lynn M. Trent
Ray I. Nakasone
Benjamin A. Fairbank, Jr.
Susan K. Kucinkas

Operational Technologies Corporation
5825 Callaghan Road, Suite 225
San Antonio, Texas 78228

Linda L. Sawin

MANPOWER AND PERSONNEL DIVISION
Brooks Air Force Base, Texas 78235-5601

February 1990
Interim Technical Report for Period September 1988 - December 1989

LABORATORY

AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235-5601

NOTICE

When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely Government-related procurement, the United States Government incurs no responsibility or any obligation whatsoever. The fact that the Government may have formulated or in any way supplied the said drawings, specifications, or other data, is not to be regarded by implication, or otherwise in any manner construed, as licensing the holder, or any other person or corporation; or as conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

The Public Affairs Office has reviewed this paper, and it is releasable to the National Technical Information Service, where it will be available to the general public, including foreign nationals.

This paper has been reviewed and is approved for publication.

WILLIAM E. ALLEY, Technical Director
Manpower and Personnel Division

DANIEL L. LEIGHTON, Colonel, USAF
Chief, Manpower and Personnel Division

REPORT DOCUMENTATION PAGE

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	February 1990	Interim - September 1988 to December 1989

4. TITLE AND SUBTITLE

Annotated Bibliography of Armed Services Vocational Aptitude Battery (ASVAB) Validity Studies

5. FUNDING NUMBERS

C - F41689-87-D-0012
PE - 63227F
PR - 2922
TA - 02
WU - 02

6. AUTHOR(S)

John R. Welsh, Jr.   Benjamin A. Fairbank, Jr.
Lynn M. Trent   Susan K. Kucinkas
Ray I. Nakasone   Linda L. Sawin

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Operational Technologies Corporation
5825 Callaghan Road, Suite 225
San Antonio, Texas 78228-1110

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Manpower and Personnel Division
Air Force Human Resources Laboratory
Brooks Air Force Base, Texas 78235-5601

10. SPONSORING / MONITORING AGENCY REPORT NUMBER

AFHRL-TP-89-76

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION / AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

This Annotated Bibliography was compiled from published and unpublished research reports documenting the validity of the Armed Services Vocational Aptitude Battery (ASVAB). Studies were included in this bibliography if they provided empirical evidence of the validity of the ASVAB through some statistically testable indication of the validity of the battery--such as the Pearson Product Moment Correlation. The only exceptions to this criterion for inclusion were studies which provided direct evidence of the construct validity of the battery through factor analytic methods and results. Studies from all four of the Armed Services, the Department of Defense, and civilian professional literature were reviewed for inclusion in the bibliography of 173 studies and reports. The bibliography has a cross-referenced subject index and author index and covers a period from 1968 to 1989.

14. SUBJECT TERMS

aptitude tests   selection
classification   test construction
enlisted personnel   validation

15. NUMBER OF PAGES

144

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

ANNOTATED BIBLIOGRAPHY OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) VALIDITY STUDIES

John R. Welsh, Jr.
Lynn M. Trent
Ray I. Nakasone
Benjamin A. Fairbank, Jr.
Susan K. Kucinkas

Operational Technologies Corporation
5825 Callaghan Road, Suite 225
San Antonio, Texas 78228

Linda L. Sawin

MANPOWER AND PERSONNEL DIVISION
Brooks Air Force Base, Texas 78235-5601

This publication is primarily a working paper. It is published solely to document work performed.

SUMMARY

This paper provides reference to studies, papers, reports, journal articles, and other printed matter dealing with the validity studies of the Armed Services Vocational Aptitude Battery (ASVAB). This paper covers a 22-year span (1968 to 1989) and encompasses all branches of the Armed Forces. Studies were included in this document if they contained correlation coefficients or other statistically testable results. Many important studies relating to norming, score-scales, and equating were not included in this bibliography unless they also addressed significant construct or content validity issues.

DTIC
COPY
INSPECTED
4

Accesion For		
NTIS CRA&I	☑	
DTIC TAB	☐	
Unannounced	☐	
Justification		
By		
Distribution /		
Availability Codes		
Dist	Avail and / or Special	
A-1		

PREFACE

TABLE OF CONTENTS

Page

ANNOTATED BIBLIOGRAPHY OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) VALIDITY STUDIES

I. INTRODUCTION

This document represents the results of an effort to compile all validity studies of the Armed Services Vocational Aptitude Battery (ASVAB). These studies and reports were obtained from documents through the Defense Technical Information Center (DTIC), Armed Services personnel research laboratories, and through personal contact with authors, scientists, and others who have been associated with the enterprise of establishing the validity of the ASVAB. The ASVAB has been in existence since 1966, and its use as the sole multiple aptitude test battery for selection and classification into the United States military began in January 1976. Validity studies of the battery began to appear in the military testing literature in the late 1960s. The earliest entries in this bibliography are from 1968; the latest entries are from January 1989.

Studies were included in this document if they contained correlation coefficients or other statistically testable results. The only exceptions to this were studies containing factor analytic data, which were also included. Many important studies relating to norming, score-scales, and equating were not included in this bibliography. Those studies that ostensibly dealt with norming and equating that are included were cited because they also dealt with significant construct or content validity issues.

The definitions of validity adopted for this document are those advanced by the Division 14 of the American Psychological Association, 1980, in the Principles for the Validation and Use of Personnel Selection Procedures: Second Edition, which points out that there are not different types of validities as much as there are different aspects of validity:

> Validity is the degree to which inferences from scores on tests or assessments are justified or supported by the evidence. It should be noted that validity refers to the inferences made from the use of a procedure, not to the procedure itself. The primary question to be answered in validation is the degree to which these inferences are appropriate (APA, 1980, pp. 2-3).

The most recent Standards for Educational and Psychological Testing (APA, 1985) uses much the same wording, stressing the importance of what is validated, specifically, the inferences drawn from test scores or selection and classification procedures, rather than the tests or the procedures themselves. Discussion of the various aspects of validity, from construct validity through criterion related validity, to content and even face validity, must take place in a context of usage, if the above definition of validity is accepted. The Standards for Educational and Psychological Testing mention that categorization of validity into the aforementioned categories is generally a matter of convenience, as strict classification of validity is nearly impossible. The categories are used here only to reflect convention.

As stated in <u>Standards for Educational and Psychological Testing</u> (APA, 1985), construct validity pertains to evidence that a test score is a measure of the psychological characteristic of interest. Ability, as a construct, should derive its meaning from a conceptual framework, the pattern of relationships among variables and other constructs. The focus of construct validity is the pattern of the relationships in the nomological net. As Wainer and Braun (1988) noted, other categories of validity, such as criterion-related validity and content validity, are subsumed under construct validity. They are merely different aspects of the same thing. Construct validity covers everything to do with a given test, from item development to the inferences drawn from test scores.

According to the above definition, all other aspects of validity evidence can be considered as part of the construct validity of the ASVAB. However, for the purposes of this report, factor analytic studies and studies providing empirical evidence of the relationship of the ASVAB to other multiple aptitude batteries that purport to measure the same abilities are taken as direct indicators of the construct validity of the battery.

The <u>Standards for Educational and Psychological Testing</u> (APA, 1985) state that content validity evidence, "demonstrates the degrees to which the sample of items, tasks, or questions on a test are representative of some defined universe or domain of content"(p. 10). The usual procedure for establishing the content domain is to tie the domain to the intended use of the instrument. The content validity of the ASVAB is established, in part, by the process used to develop new forms. This process is documented in a number of developmental reports that define the content of the subtests and items. The content validity is heavily dependent on Service "experience" with a given ability measure and depends on the results of validity studies of previous batteries to indicate criterion space that may not be measured with existing batteries. Thus, new or experimental instruments are tried out, and if found to be predictive of the criteria of interest, are eventually implemented

The last aspect of validity is criterion-related validity evidence, defined as evidence that test scores are systematically related to one or more criteria (APA, 1985, p. 11). In the case of the ASVAB, the majority of validity evidence falls into this category, and the primary criterion used in most ASVAB validity studies is success in training.

The user of this annotated bibliography should be aware of several general features of its construction and the cross indexing scheme in order to use the bibliography.

Each study is listed first with the study identifier. The study identifier is a key index in the annotated bibliography (see page 3). The first two alpha characters in the study identifier contain the initials of the Service that produced the study, and the next two numeric digits indicate that year the study was produced. For example, MC85008 indicates that the study was produced by the Marine Corps in 1985. The last three digits indicate the sequence in which that study was listed in this bibliography for that year; in this case the eighth Marine Corps study listed for 1985.

Then information identifying the publishing agency, the date of publication, and the type of publication is provided. After the identifying information, the user will find either an author provided abstract or summary; or, for those studies that did not have an author abstract or summary, a contractor summary. The type of summary provided, either author or contractor written, is indicated by the words "Author" or "Contractor" in parenthesis following the summary.

The Author Index is a cross index which contains a listing of author last names and initials by study identifiers. All studies in which a given individual is listed as an author are indicated. The Subject Index contains all the studies in the bibliography classified by subject.

The following are the commonly used abbreviations for the Annotated Bibliography for the Armed Services Vocational Aptitude Battery (ASVAB) Validity Annotated Bibliography).

Study Identifier:

The study identifier is composed of three parts. The first part is the initial two characters. The two letters correspond to the originating or publishing Service of the article or report.

AF - Air Force
AR - Army
AS - Armed Services
CV - Civilian
CG - Coast Guard
MC - Marine Corps
NV - Navy

The second part (the third and fourth characters) of the study identifier gives the year of publication.

The last section of the study identifier (the last three characters) is a sequential number used by Operational Technologies Corporation to count the number of studies by service and year.

The Publication Nature uses a number of abbreviations as follows:

TR - Technical Report
TP - Technical Paper
TM - Technical Manual
TH - Thesis
JA - Journal Article
BK - Book
UM - Unpublished Manuscript

II. UNITED STATES AIR FORCE

STUDY IDENTIFIER: AF68001

Vitola, B. M., & Alley, W. E. (1968). Development and standardization of Air Force composites for the Armed Services Vocational Aptitude Battery (AFHRL-TR-68-110, AD-688 222). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

This report describes the development and standardization of Air Force composites for the Armed Services Vocational Aptitude Battery (ASVAB). Characteristics of ASVAB items, subtests, and descriptive data are presented, as well as intercorrelations among the Airman Qualifying Examination (AQE), Project TALENT tests, and ASVAB variables. Correlation of the ASVAB composites with those of AQE-66 and Project TALENT indicates high degree of relationship. Similarly, comparison of means and standard deviations derived from the norming samples of AQE-66 and the ASVAB indicates little difference between the samples. Finally, application of the Kuder-Richardson Formula 21 results in high reliability coefficients for the ASVAB composites: General AI.86, Administrative AI.91, Mechanical AI.84, and Electronics AI.91. Because of the high relationships between the aptitude composites of the ASVAB and the AQE, the AQE distributional data currently in use in selective recruiting programs and in the high school testing program are considered to be valid and generalizable to Air Force aptitude indexes derived from the ASVAB. (Author)

STUDY IDENTIFIER: AF70001

Guinn, N., Tupes, E. C., & Alley, W. E. (1970). Cultural subgroup differences in the relationships between Air Force aptitude composites and training criteria (AFHRL-TR-70-35, AD-715 922). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

This study was designed to explore the relationships between aptitude index composite and final school grade in technical training for various cultural subgroups based on race, educational level, and geographical area of enlistment. Regressions of final school grade on aptitude index were compared for the different subgroups in ten samples of technical school graduates. Results indicated that where the relationship between aptitude score and performance of Negroes and high school non-graduates was overestimated. No consistent trend in prediction error was noted for the various areas of enlistment across all technical schools. However, there was a general tendency for the final school grade for personnel from the North-Northeast area to be overpredicted while those from the Far West-Pacific Coast area tended to be underpredicted. (Author)

4

STUDY IDENTIFIER: AF70002
Grunzke, M. E., Guinn, N., & Stauffer, G. (1970). Comparative performance of low ability airmen (AFHRL TR-70-4, AD-705 575). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The military accessions program "Project 100,000," established in 1966, has as one of its goals enlistment in the military services a yearly minimum of 100,000 men who have previously been declared ineligible for military service because of failure to meet required mental or, in some cases, physical standards. This study was conducted to evaluate the progress of these marginal ability personnel who enlisted in the United States Air Force. Data were collected on their performance in training and during assignment to jobs throughout the Air Force. The analysis revealed that their adaptability to the Air Force and job performance were at a lower level than that of the control subjects. (Author)

STUDY IDENTIFIER: AF72001
Shore, C. W., & Marion, R. (1972). Suitability of using common selection test standards for Negro and white airmen (AFHRL-TR-72-53, AD-775 846). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The effectiveness and equity of applying uniform selection standards to both Negro and white Air Force enlistees was investigated by regression analyses. For both racial groups, the relationship between the Air Force selection test (Airman Qualifying Examination) as the predictor and a measure of job knowledge (Specialty Knowledge Test) as the criterion was compared for Negro and white airmen belonging to one of 16 promotion groups. In no groups were Negro criterion scores underpredicted by the selection tests. In nine groups there were racial differences in regression lines, and in all instances of differences the Negro criterion scores were overpredicted by the common regression lines. (Author)

STUDY IDENTIFIER: AF73001
Vitola, B. M., Mullins, C. J., & Croll, P. R. (1973). Validity of the Armed Services Vocational Aptitude Battery - Form 1 to predict technical school success (AFHRL-TR-73-7, AD-767 578). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Validities of the four aptitude indexes of the Armed Services Vocational Aptitude Battery (ASVAB), Form #1, and the Airman Qualifying Examination-66 (AQE), were determined for final grades in 46 airman training courses. Comparisons were made between AQE and ASVAB in terms of their ability to predict technical school success. The results demonstrate that ASVAB is an effective instrument for use in the military high school testing program and may be used satisfactorily, as is AQE, to assign enlistees to technical training. Three of the four selector aptitude indexes of the ASVAB (General, Administrative, and Electronics) evidenced their appropriateness by having higher validities for their computer courses than any of the other ASVAB aptitude indexes. This sort of specific validity did not obtain for the aptitude index of the Mechanical cluster. However, 15 of the 16 validities obtained for the selector index in the mechanical area were at a significant (.01), useful and acceptable level. (Author)

STUDY IDENTIFIER: AF74001

McGrevey, D. F., Knouse, S. B., & Thompson, R. A. (1974). Relationships among an individual intelligence test and two Air Force screening and selec*ion tests (AFHRL-TR-74-25, AD-781 033). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The objective of this study was to determine if the two main aptitude measures used by the Air Force in selection and classification are accurately assessing manpower abilities in an unbiased manner. These two composites of interest were the Airman Qualifying Examination (AQE) used from 1953 to 1973 and the Armed Forces Qualification Test (AFQT) which is presently in use for selection. This study investigated the relationships of AQE and AFQT scores to other ability measures, specifically the Wechsler Adult Intelligence Scale (WAIS).

The subjects were 200 non-prior service male Air Force trainees. This random sample consisted of 100 black and 100 white airmen stationed at Lackland AFB, TX, between February 1972 and February 1973.

The WAIS was administered to the subjects, and three scores of Verbal IQ (VIQ), Performance IQ (PIQ), and Full Scale IQ (FSIQ) were calculated. These scores were then compared to 4 AQE Aptitude Indices (AI) and the AFQT through correlational procedures, t-tests, and regression analyses.

To ensure sample representativeness, a series of z-tests was conducted between the sample and the total 1972 Air Force accession data. There were no significant differences between any AQE or AFQT score means.

Means and standard deviations of the 4 AQE AI's, the AFQT scores, and the 3 WAIS indices were compared for the black and white samples. The t-tests between the black and white airmen mean scores indicated that blacks scored significantly lower than whites on all measures except for the Digit Span and Digit Symbol subtests of the WAIS.

The uncorrected correlations between AFQT, AQE AI's, and WAIS IQ scores for whites were all positive and significant (p < .05). All uncorrected correlations for the black airmen were positive and significant (p < .05) except for the correlations between PIQ vs. AQE-A, VIQ vs. AQE-M, and FSIQ vs. AQE-M which were positive but nonsignificant

The intercorrelations among the scores were consistently lower for the black sample than for the white sample.

With regard to the regression analyses, the WAIS IQ's were the criterion scores with the AFQT and the 4 AQE AI's as indiviuual predictor scores. These analyses were used to determine if racial differences existed between test scores. With the VIQ used as the criterion, there were significant race interactions for all AQE AI's as predictors but no significant race effects were indicated with the AFQT as the predictor. When the PIQ served as the criterion, significant intercept differences were indicated with the AFQT and AQE-G and AQE-A as predictors. Significant intercept differences were found when the FSIQ served as the criterion and the AFQT and AQE-A scores were the predictors. Significant interactions were found with the AQE-E, AQE-G and AQE-M as predictors.

Future ASVAB test constructs should include research efforts which investigate the importance assigned to situational and prior knowledge items. Such studies might be able to control for the differential quality of education of black and white recruits with similar levels of education.

The much lower intercorrelations of the black sample suggested that the selection tests and the WAIS IQs were measuring divergent factors, for example a literacy construct. Future investigations would help in clarifying racial differences in the AFQT and AQE with regard to other aptitude batteries. (Contractor)

STUDY IDENTIFIER: AF74002
Harris, R. K., & Huckell, R. K. (1974). Predicting academic success in secondary schools from the general technical composite on the Armed Services Vocational Aptitude Battery (AFVTG-TR-74-2). Randolph AFB, TX: Armed Forces Vocational Testing Group.

This Technical Research Note reports correlations between student scores on the General Technical (GT) composite of the Armed Services Vocational Aptitude Battery (ASVAB) and cumulative grade point averages (GPAs). Data were collected on 911 juniors and seniors selected from a sample at 22 secondary schools in the San Antonio metropolitan area.

The GT score was found to significantly relate to overall academic performance for 19 out of the 22 samples, with a median rho of 44. Results indicate that the level of relationship was not differentially affected by school- specific ethnic group composition, school expenditures, or average teacher/pupil ratio.

Neither the samples used nor conclusions presented in this study should be construed as representative of high schools throughout the country. Since socio-economic levels represented in the various samples go from the highest to the lowest ranges, limited generalizations may be meaningful to other school districts with similar diverse populations.

This is an initial report exploring the relationship between student performance on various ASVAB scales and various criteria in the civilian academic sector. Additional studies will further assess relationships across various grade levels, in differing types of training situations, and across different time spans. As such, this first study should be interpreted as a prelude to additional and more comprehensive analyses of the Armed Services Vocational Aptitude Battery. (Author)

STUDY IDENTIFIER: AF75001
Weeks, J. L., Mullins, C. J., & Vitola, B. M. (1975). Airman Classification Batteries from 1948 to 1975: A review and evaluation (AFHRL-TR-75-78, AD-A026 470). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

From 1948 to 1975, the United States Air Force employed ten different multiple aptitude batteries for the purpose of either classifying or selecting and classifying nonprior service enlistees. Each of the different batteries is described and evaluated in terms of standardization, reliability, and validity. (Author)

STUDY IDENTIFIER: AF76001
Jensen, H. E., & Valentine, L. D., Jr. (1976). Validation of ASVAB-2 against civilian vocational-technical high school criteria (AFHRL-TR-76-16, AD-A023 118). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

This technical report presents the relationship between performance of high school students on the components and composites of the ASVAB-2 and their subsequent performance in civilian vocational-technical courses.

Applicability of current Air Force composites to specific vocational categories is also presented. (Author)

STUDY IDENTIFIER: AF76002
Harris, D. A. (1976). Classification typology for predicting performance in Air Force technical training (AFHRL-TR-76-91, AD-A039 268). Lowry AFB, CO: Technical Training Division, Air Force Human Resources Laboratory.

This study showed that technical training students could be classified into potential instructional groups, using linear typal analysis. However, the operational and practical consequences of using linear typal analysis were not demonstrated in this study. Further study was suggested in order to determine the practical significance of grouping individuals into instructional groups, based on linear typal analysis. (Author)

STUDY IDENTIFIER: AF76003
Alley, W. E., Wilbourn, J. M., & Berberich, G. L. (1976). Relationships between performance on the Vocational Interest-Career Examination and reported job satisfaction (AFHRL-TR-76-89, AD-A040 754). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

This report describes the validation of an Air Force vocational interest inventory in the enlisted force. The Vocational Interest-Career Examination (VOICE) was administered to 18,000 recruits during basic military training. After approximately one year on the job, they were resurveyed to determine the extent to which they were satisfied with their respective occupational assignments. Individual aptitude variables from the Armed Services Vocational Aptitude Battery (ASVAB) served as control measures. Multiple regression analyses were used to characterize relationships between entry-level interests and eventual job satisfaction and to explore moderating effects due to sex prediction of job satisfaction for both males and females. Recommendations for operational implementation of the procedure were discussed. (Author)

STUDY IDENTIFIER: AF76004
Kettner, N. (1976). Armed Services Vocational Aptitude Battery (ASVAB Form 5): Comparison with GATB and DAT tests (AFHRL-TR-76-78, AD-A035 305). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The purpose of this study was to compare test performance of high school students on the Armed Services Vocational Aptitude Battery (ASVAB) with the General Aptitude Test Battery (GATB) and the Differential Aptitude Tests (DAT). The design of the study provided

for information on test intercorrelations, prediction equations for the ASVAB tests from the commercial tests and conversion tables between highly similar tests across batteries. Separate comparisons were made by grade and sex. A total of 1,232 students were tested and each student took the ASVAB and one other battery. Six of the tests in the ASVAB correlated highly with tests in the commercial batteries. The remainder of tests in the ASVAB were information type tests that had low to moderate correlation with the tests in the commercial batteries. The correlations for the males were generally higher than for the females and the correlations increased with grade. The multiple correlation coefficient in the prediction of the ASVAB tests from the commercial tests ranged from zero to .90. (Author)

STUDY IDENTIFIER: AF76005

Wilbourn, J. M., Guinn, N., & Leisey, S. A. (1976). Validation of non-verbal measures for selection and classification of enlisted personnel (AFHRL-TR-76-72, AD-A037 589). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory

A non-verbal aptitude battery was administered to 13,584 non-prior-service male basic airmen. Additional aptitudinal and educational data were combined with the non-verbal tests to assess their usefulness in predicting final technical school grade. Although the correlations between the individual subtests and final school grade (FSG) were not found to be statistically significant in every technical course, figure analogies and dial reading appear to demonstrate the highest relationship with FSG. The multiple correlations based on a composite of all non-verbal subtests reached statistical significance in over 75% of the technical areas in both the total sample and lower ability subgroups, and the composite was found to make an unique and significant contribution to the prediction of FSG over and above the Armed Forces Vocational Aptitude Battery (ASVAB-3) Selector Aptitude Index (AI) alone. When additional aptitudinal and educational data were added to composite, the predictive efficiency of the composite increased. These findings substantiate the validity of the non-verbal test measures and the potential utility of including these measures in future operational test batteries. (Author)

STUDY IDENTIFIER: AF76006

Jensen, H. E., Massey, I. H., & Valentine, L. D., Jr. (1976). Armed Services Vocational Aptitude Battery Development (ASVAB Forms 5, 6, and 7) (AFHRL-TR-76-87, AD-A037 522). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Toward the objective of satisfying enlistment production requirements of all the services, ASVAB Forms 5,6, and 7 were redesigned to incorporate the content of current service classification batteries. The reconfigured battery contains 12 subscales plus the Army's Classification Inventory.

Normative procedures included the administration of ASVAB 5,, 6, and 7 at a nationally representative sample of Armed Forces Entrance and Examination Stations (AFEES). Each examinee took one form of the ASVAB along with the AFQT composite from the Army Classification Battery or ASVAB-3. A stratified random sample of 1,600 cases was used in the development of service norms. (Author)

STUDY IDENTIFIER: AF76007
Fletcher, J., & Ree, M. J. (1976). <u>Armed Services Vocational Aptitude Battery (ASVAB) correlational analysis, ASVAB Form 2 versus ASVAB Form 5</u> (AFHRL TR-76-70, AD-A032 593). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

A total of 2,052 U.S. high school boys and girls, selected from 10 geographical regions, were tested on consecutive half-days using the Armed Services Vocational Aptitude Battery (ASVAB) Form 2 and ASVAB Form 5 vocational aptitude test batteries. Effects of fatigue, training, environmental factors, and proctorial variation were minimized by experimental design. An extensive program of optical scanning, computer analysis, inter-test comparisons, correlation matrix generation, factor analysis and equipercentile calculations was conducted. Three new tests in the larger battery (ASVAB Form 5) were vocationally oriented as opposed to scholastically oriented. Seven tests common to both batteries had reliability coefficients of 0.56 to 0.76. A new factor in vocational testing, tentatively described as "attention to explicit rules," was identified. (Author)

STUDY IDENTIFIER: AF77001
Valentine, L. D., Jr. (1977). <u>Prediction of Air Force technical training success from ASVAB and educational background</u> (AFHRL-TR-77-18, AD-A041 735). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Nonprior service Air Force accessions during September 1973 through October 1975 were used as the sample in a series of analyses to (a) determine utility of educational data in predicting technical training success, (b) validate ASVAB, Form 3, (c) determine extent of overlap between education data based predictions and test based predictions, and (d) assess race and sex equity of predictions. Major findings are that (a) both test data and educational background data contribute uniquely to prediction, (b) test data makes the largest unique contribution, and (c) some limited consideration of race and sex could improve predictions. Finding (c) applies only to a limited subset of the 43 training groups analyzed. (Author)

STUDY IDENTIFIER: AF77003
Mathews, J. J. (1977). <u>Analysis Aptitude Test for selection of airmen for the Radio Communications Analysis Specialist course: Development and Validation</u>. (AFHRL-TR-77-74, AD-A051 962). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The objective of this study was to assess the increase in prediction of Radio Communication Analysis Specialist course performance when an Analysis Aptitude (AA) test is added to current selection instruments. Highly significant validities were obtained with AA for samples of 173 Air Force and 144 Army students. A multiple R of .7 in predicting final grades from AA and the three subtests of the Armed Forces Qualification Test (AFQT) was obtained for a subsample of 108 Army students. Minimum qualification scores of 71 percentile on AFQT and a raw score of 15 on AA were recommended for selection of students. (Author)

STUDY IDENTIFIER: AF77004
Hawley, J. K., Mullins, C. J., & Weeks, J. (1977). Jet Engine Mechanic - AFSC 426X2: Experimental job performance tests (AFHRL-TR-77-73, AD-A053 302). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Historically, the Air Force has used technical school grades (TSGs) to validate aptitude tests. The purpose of the current study was to develop a job-related criterion metric against which to validate aptitude measures. Along this line, three Criterion Tests relevant to the 3, 5, and 7 skill level of PAFSC 426X2-jet engine mechanic-were developed. ANOVA results demonstrated that mean Criterion Test scores were significantly different across the relevant skill levels. Stepwise regression results indicated that Armed Services Vocational Aptitude Battery (ASVAB) information subscales were most predictive of Criterion Test performance for experienced mechanics. Considering only basic airmen, the ASVAB information measures and general knowledge subscales were most related to Criterion Test performance. When TSGs were regressed on ASVAB scores, general knowledge scales were most consistently predictive of technical school performance. The regression TSGs on Criterion Test scores indicated that only Test 1 was generally related to technical school performance. (Author)

STUDY IDENTIFIER: AF77005
Leisey, S. A., & Guinn, N. (1977). Development of a screening methodology for entry into Medical Technical training courses (AFHRL-TR-77-49, AD-A048 119). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

This research reports the evaluation of a current screening methodology and the feasibility of developing a refined selection methodology for entry into three medical technical training courses: Aeromedical Specialist (90130), Environment Health Specialist (90730), and Physiological Training Specialist (91130). A sample of 1,003 students who entered these courses during the 1973-1975 time period were administered three commercial tests by the USAF School of Aviation Medicine (SAM). Aptitudinal and biographical data were retrieved from historical record files. Multiple linear regression analyses were accomplished to determine whether the commercial tests and/or aptitudinal and biographical data contributed to the prediction of training performance. It was found that the most effective predictor composite contained both the commercial tests and the aptitudinal and biographical data. Results indicated that such a predictor composite can help in identifying potential failures and/or personnel requiring remedial training in these courses. (Author)

STUDY IDENTIFIER: AF77006
Guinn, N., Wilbourn, J. M., & Kantor, J. E. (1977). Preliminary development and validation of a screening technique for entry into the security police career field (AFHRL-TR-77-38, AD-A043 919). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

A sample of 4,502 basic airmen, assigned to security police career field, were administered an experimental battery consisting of biographical, attitudinal, and interest items. Aptitudinal scores and criterion data (in/out of service after completion of technical training) were retrieved from the airman record files. Multiple linear regression analyses were accomplished to determine the utility of aptitudinal and inventory data in predicting adaptability to the security police career field. The multiple correlations of the final selector composites derived from this study were .46 and .47. Since the small number of eliminees

in the sample precluded cross-application of regression weights, it was recommended that further validation be accomplished to determine the reliability and stability of the predictor composites. (Author)

STUDY IDENTIFIER: AF77007

Vitola, B. M., Guinn, N., & Wilbourn, J. M. (1977). Impact of various enlistment standards on the procurement-training system (AFHRL-TR-77-16, AD-A040 752). Lackland AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Data were collected on male and female personnel who graduated or were eliminated from basic military training (BMT) or technical training (TT) in CY 1972-1974. Information on the enlistees included aptitude scores, education, age, sex, and racial subgroup membership. Twenty-one enlistment requirement standards were generated and compared to the enlistment requirements of 1974 and 1975. Each standard was comprised of subsets of aptitude data, age, and educational qualifications. Criterion assessment included: (a) cost associated with amount of attrition from BMT and TT, (b) percentage of the population rejected by the standard, (c) effect of each standard on the quality of the accession population and, (d) impact of each standard on racial subgroup mix. Results of the investigation indicate that a flexible index of enlistment requirements can be provided personnel planners which takes into consideration, cost, quality, racial subgroup mix, and expansion or contraction of recruiter market. Data from this study lead to a recommendation that two standards be considered as a replacement for the 1975 enlistment requirements: (a) a minimum aptitude composite of MAGE 165 and either high school graduation or less than high school with a score between 65-99 on the AFQT (165/HSC) and, (b) all the requisites of 165/HSC plus a minimum age requirement of 17 years and 6 months (165/AGE/HSC). (Author)

STUDY IDENTIFIER: AF77008

Wiley, L. N., & Hahn, C. P. (1977). Task level job performance criteria development (AFHRL-TR-77-75, AD-A055 694). Brooks AFB, TX: Occupation and Manpower Research Division, Air Force Human Resources Laboratory.

This study investigated the possibilities for improving the identification of the requirements for jobs by studying performance of job incumbents on separate tasks. Three specialties were selected for study: 291X0, Telecommunications Operations Specialist; 304X4, Ground Radio Communications Equipment Repairman; 431X1C, Aircraft Maintenance Specialist, single- and dual-engine jet. Incumbents, peers, and supervisors rated the performance of the incumbents on a selected set of tasks. In addition, job inventories and an experimental test battery were administered to the incumbents. The battery included 11 short experimental cognitive tests, a Biographical Inventory, the Vocational Interest-Career Examination (VOICE), and a 43-item Job Satisfaction Information blank. Data of record were also obtained from Air Force files to provide such items as incumbent grade, service time, sex, education at enlistment, and Aptitude Index scores. Correlations were run between raters, correlating performance on separate tasks, and between raters, correlating performance on six overall dimensions of appraisal. Cross-rater reliabilities were low, but significant, on task assessments, and in the $r = .40$ range on overall ratings. Similarly low correlations were found for nontask predictors, such as grade, service time, and Aptitude Indexes. All types of obtained measures, except data on the origins of training and on task performance satisfaction, were put into regression problems to account for the six overall performance ratings made by peers and supervisors. The data suggest that different factors

12

were important for different kinds of work, and for different dimensions of performance appraisal. Of all the many findings of the study, by far the most enlightening was that difficult tasks (in terms of learning time) were better measured performance. This arose from less use of the top of the rating scale, and it produced lower performance appraisals from the group (AFSC 304X4) which had been selected by the Air Force for having the highest aptitude scores. Should subsequent analyses prove that this finding also applies to job ratings within AFSCs, the result would have implications for Air Force job performance appraisal. (Author)

STUDY IDENTIFIER: AF77010

Valentine, L. D. Jr., & Mathews, J. J. (1977). Validity of high school composites from Armed Services Vocational Aptitude Battery (ASVAB) (Forms 6 and 7) for Air Force Technical Training (Staff Report). Lackland AFB, TX: Air Force Human Resources Laboratory.

This study is a staff report that summarizes validity analyses of previous and proposed high school composites for use in the 1977-1978 school year with ASVABs 5/6/7.

The new composites were developed and based on a factor analysis of ASVABs 6 and 7, administered to Air Force recruits who had matched training school grades from Air Force files. Data from 16 Air Force technical training courses had sufficient sample sizes for the correlational analysis of validity of the old and newly developed high school composites.

Uncorrected validities are presented in the study as well as median correlational values by form for each of the sixteen Air Force training courses.

The proposed factor based composites would prove at least as useful as the previous set for prediction of success; they would probably prove more useful to counselors because of the greater spread of the obtained validities coupled with lower intercorrelations. (Contractor)

STUDY IDENTIFIER: AF78001

Mathews, J. J., Valentine, L. D., Jr., & Sellman, W. S. (1978). Prediction of reading grade levels of service applicants from Armed Services Vocational Aptitude Battery (ASVAB) (AFHRL-TR-78-82, AD-A063 656). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

The objectives of this study were to assess reading ability of military service applicants and accessions and to determine the relationship between ASVAB measures and reading scores. Data were collected at Armed Forces Examining and Entrance Stations. This report concerns 2,432 subjects given the Gates-MacGinitie reading test and a subsample given the Nelson-Denny reading test. The median reading grade level for service applicants was 9.0 based on Gates-MacGinitie and 9.5 based on Nelson-Denny. The median Gates-MacGinitie reading grade level of applicants who qualified for services was 10.2 compared to 5.7 for non-qualified applicants. The Armed Forces Qualification Test correlated .76 with the average of reading grade levels for the two reading tests. The ASVAB General Technical (GT) composite (General Aptitude Index (AI) for Air Force) correlated .79 with average reading grade level. It was recommended that GT be used as an index of reading grade level for service applicants. (Author)

13

STUDY IDENTIFIER: AF79001
Mullins, C. J., Earles, J. A., & Wilbourn, J. M. (1979). Calculation of predictor composites in the absence of a criterion (AFHRL-TR-79-53, AD-A080 921). Brooks AFB, TX: Personnel Research Division, Air Force Human Resources Laboratory.

Sometimes a prediction battery is needed for a specialty in which no adequate criterion is obtainable within a reasonable period of time. This is the second study into two techniques for producing a criterion synthetically. One technique (called R-Technique) involves the rating by experts of 100 profiles showing all the predictor variables under consideration. Another (the M-Technique) involves the rating of factors by the same experts. In both instances, the synthetic criterion data are used to produce weights for the predictors. In order to check the efficiency of the prediction composites emerging from the use of the synthetic criteria, they are compared with a cross-validated composite obtained in the usual manner. Synthetic composites in the earlier study were predicted as well as the empirical composite; however, in this study, the results were much poorer. There are differences in predictive efficiency across the four technical schools studied, across the three sets of predictor variables used, and across the kinds of experts used (psychologists, instructors, and administrative airmen). There are also differences in efficiency associated with the size of the expert groups, producing more effective composites. (Author)

STUDY IDENTIFIER: AF80001
Skinner, M. J., & Alley, W. E. (1980). Performance of retrained airmen in Air Force technical schools (AFHRL-TR-80-7, AD-A090 535). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

[This TR superseded by AFHRL-TR-83-18.]
Research was conducted to determine the effect of changing occupational specialties on the performance of Air Force retrained enlistees attending basic technical schools. The academic performance and attrition rates of approximately 20,000 retrainees and 230,000 non-prior-service enlistees (non-retrainees) attending 272 schools were compared. Schools were categorized by selector aptitude index requirements into 18 subgroups for analysis. Data were compiled from historical personnel records. Multiple linear regression analyses examined the relationship between school performance criteria and retraining status and aptitude as well as the amount of military service, career status, and background experience acquired prior to retraining for each subgroup.

Results indicated that the performance of retrainees was comparable or superior to non-retrainees with equivalent aptitudes. Further, among retrainees performance generally increased as more time was spent in military service before changing specialties. Retrainees who were career airmen with more than three years of service tended to do better than non-career airmen in training. Results also indicated that experience in a specialty with the same aptitude index (Mechanical, Administrative, General, or Electronics) as the retraining specialty typically facilitated performance. A characteristic increasing relationship between aptitude and success in technical training was found. Potential research applications to retrainee selection and assignment procedures were considered. (Author)

STUDY IDENTIFIER: AF81001
Mullins, C. J., Earles, J. A., & Ree, M. (1981). Weighting of aptitude components based on differences in technical school difficulty (AFHRL-TR-81-19, AD-A102 045). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Within aptitude areas (Mechanical, Administrative, General, or Electronic) in the Air Force, some technical schools require higher levels of aptitude for admission than do others (for example, there are G40 schools, G60 schools, and G80 schools based on General test scores in 40th, 60th, and 80th percentiles respectively). The schools, however, give grades on a scale from 70 to 100, regardless of the difficulty of the school curriculum. This means that a score of 82 in a G40 school is recorded the same as an 82 in a G80 school, although the score in a G80 school must indicate a higher level of performance than the same score does in the G40 school. When validities are computed across an entire aptitude area, the different meanings of identical numbers across schools of varying difficulty must confound the results.

This study is an evaluation of a method of adjusting technical school grades issued by schools of varying difficulty so that a new criterion is formed with all school grades adjusted to the same metric. This new criterion was then used to recompute aptitude indexes, which were compared with aptitude indexes computed in the conventional manner. The new aptitude indexes predicted school grades in a cross-validation sample better than did the conventional aptitude indexes. (Author)

STUDY IDENTIFIER: AF82001
Mathews, J. J., & Ree, M. J. (1982). Enlistment screening test forms 81a and 81b: Development and calibration (AFHRL-TR-81-54, AD-A113 464). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This study describes the development and norming of two parallel Enlistment Screening Test (EST) forms for use by military recruiters in predicting applicant success on Armed Services Vocational Aptitude Battery (ASVAB) selection composites. The EST was developed to reduce enlistment processing costs for transportation and boarding of service applicants. By administering this test at local recruiting stations, those applicants who would most likely meet service mental qualification standards could be identified and would be sent to centralized testing stations. Data on EST items were collected from a sample of applicants for military enlistment at geographically dispersed recruiting stations. Item analysis was used in item selection for operational forms. Descriptive statistics including correlations and frequency distributions of EST with ASVAB selection composites were computed. The EST was calibrated (or equated) to the Armed Forces Qualification Test (AFQT) through the method of equivalent percentiles. The ESTs appear to be highly reliable instruments, discriminating well throughout a range which includes major service selection cutoff points. The two EST forms appear parallel based on highly similar distributions of item difficulty and criterion correlation values. EST scores predict AFQT percentiles quite well (r = .83). In addition, EST content is similar to that of AFQT. (Author)

STUDY IDENTIFIER: AF82002

Sympson, J. B., Weiss, D. J., & Ree, M. J. (1982). <u>Predictive validity of conventional and adaptive tests in an Air Force training environment</u> (AFHRL-TR-81-40, AD-A119 031). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Conventional ASVAB-7 Arithmetic Reasoning (AR) and Word Knowledge (WK) tests were compared with computer-administered adaptive tests as predictors of performance in an Air Force Jet Engine Mechanic (JEM) training course. All test items were calibrated using a 3-parameter logistic item response model. Adaptive tests were composed of items selected by Bayesian and stratified maximum information (STMI) strategies. Each of 495 JEM trainees was administered three AR tests and three WK tests by computer, including two adaptive tests (Bayesian and STMI) and one conventional ASVAB test in each ability area. Since the two adaptive tests selected items from the same item pools, in each ability area a special item fill-in procedure was used during an examinee's second adaptive test to eliminate repeated presentation of the same items. The conventional ASVAB tests were scored by number-correct, Bayesian, and maximum likelihood methods. Order of test administration was counterbalanced in subgroups of examinees. Validity data were analyzed by multivariate linear-model analyses with testing-strategy/scoring-method (TSSM), item type (AR, WK) and/or order of administration as independent variables, and single-test and composite validities as dependent variables. Additional dependent variables studied included characteristics of ability estimates (distributions, intercorrelations, and score information functions), examinee and computer response times, and the effect of fixed versus variable entry.

Results supported earlier research in showing somewhat longer examinee response times for adaptive tests in comparison to conventional tests. These longer response times were attributed to the higher relative difficulty of the items in the adaptive tests. Score information analyses showed that the adaptive tests provided considerably higher levels of information than did the conventional tests at all ability levels.

The linear-model analysis of single-test validities showed a significant three-way interacting among TSSM, item type, and order of administration, as well as main effects for item type and TSSM. Analysis of the main-effect contrasts for TSSM showed that maximum likelihood scoring of ASVAB resulted in lower validities than either the number-correct or Bayesian scoring of ASVAB. None of the contrasts involving adaptive versus conventional tests between the adaptive strategies.

Analyses of composite validities also showed no significant effects involving adaptive versus conventional tests, although there was again a significant interaction involving the adaptive tests. The data thus indicated no significant differences in validities between equal-length adaptive and conventional tests. The data did indicate, however, that the STMI adaptive testing strategy could achieve validities that approximated those of the ASVAB tests while requiring only one-third to one-half the number of items. It is concluded that similar validities for adaptive tests and conventional tests are supportive of the use of adaptive tests in military selection testing because of additional advantages inherent in computerized adaptive administration of ability tests. (Author)

STUDY IDENTIFIER: AF82003
Ree, M. J., Mullins, C. J., Mathews, J. J., & Massey, R. H. (1982). Armed Services Vocational Aptitude Battery: Item and factor analyses of Forms 8,9, and 10 (AFHRL-TR-81-55, AD-A113 465). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This study presents an investigation of the characteristics of the items and factors which make up Forms 8, 9, and 10 of the Armed Services Vocational Aptitude Battery (ASVAB).

Data on the ASVAB forms were collected from a large sample of applicants for military enlistment at 20 geographically dispersed Armed Forces Examining and Entrance Stations (AFEES). Item and factor analyses were conducted on samples equated in ability through an external reference test, the Armed Forces Qualification Test 7a (AFQT-7a).

The true score theory item analyses show the subtests to have relatively easy items in most cases. Item-test biserial correlations are quite high (about .60), indicating subtest internal consistency. In keeping with these indexes, the subtest means are high, and distributions of raw scores are skewed toward the easy range. Subtest scores have high reliability as befits homogeneous groups of items.

Item response theory analyses show much the same information with easy items. Test information curves are generally unimodal and skewed toward lower ability subjects. Average item information is quite good.

The factor analyses show the six forms to be quite similar to each other and to previous ASVAB forms. Solutions with the four factors labeled Verbal, Mathematical, Vocational Information, and Clerical Speed showed a median intercorrelation of .51 with a limited range. (Author)

STUDY IDENTIFIER: AF83002
Finstuen, K., & Alley, W. E. (1983). Occupational and personnel correlates of first term enlisted tenure in the Air Force (AFHRL-TR-82-36, AD-A132 346). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Traditionally, researchers concerned with enlisted airmen separation and attrition have focused primarily on personnel characteristics associated with those losses. In contrast, studies from the civilian sector have routinely examined the effects of both personnel characteristics and occupational data associated with turnover rates. This research was designed to assess the interactive effects of Air Force occupational specialty and personnel characteristics on predictions of tenure for first-term enlisted airmen.

A set of multiple linear regression equations was developed to examine the occupational and personnel correlates associated with airmen tenure. A sample of 280,039 airmen provided the data base from which these models were generated. Two tenure criteria were developed to reflect (a) the number of months served (up to 36) and (b) a dichotomous variable coded 1 if the airmen was still in the service after 36 months and 0 otherwise. The first prediction model identified each of 186 Air Force enlisted specialties. A second model consisted of personnel variables such as age, sex, aptitude, race, and family information. The third model consisted of an equation containing the personnel characteristic variables plus the Air Force enlisted specialty variables. A final model contained each personnel variable interacting with each specialty variable.

Predictions of both tenure criteria were highly significant based on the specialty model as were those based on the personnel model. A test of the third model against the fourth model revealed that predictions of tenure are differentially influenced by the combination of personnel characteristics specific to each specialty. This finding suggests that tenure predictions should be made on an individual occupational basis considering each specialty as a separate predictive framework. A follow-on analysis substantive predictive efficiency was associated with the occupational model as well as with the personnel characteristics model. Demonstrations of the prediction system applied to a 5% random sample of airmen were also included for consideration by personnel selection and assignment managers to emphasize the effects that occupational assignment strategies would have on increasing airmen tenure in the first term. (Author)

STUDY IDENTIFIER: AF84001
Wilbourn, J. M., Valentine, L. D., Jr., & Ree, M. J. (1984). Relationships of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, and 10 to Air Force technical school final grades (AFHRL-TP-84-8, AD-A144 213). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

The Armed Services Vocational Aptitude Battery (ASVAB), consisting of 10 subtests, is used as the one multiple test instrument for enlisting young men and women into the military services. The ASVAB Forms 8, 9, and 10 are used by the Air Force to select and classify enlistees into four basic aptitude areas: Mechanical, Administrative, General, and Electronics. The ASVAB also yields a common selection score called the Armed Forces Qualification Test (AFQT). The ASVAB has been in joint service use since 1976; scores from the various composites play a major role in assessing the qualifications of young men and women for assignment to technical training and military jobs. This study looks at the efficacy of the ASVAB for these purposes and focuses on Forms 8, 9, and 10, which were implemented in 1980.

A group of 29,619 male and female enlistees tested between October 1980 and March 1982 comprised the subjects of the study. Each of these enlistees attended a technical training course and received a final school grade which was used as the criterion. Only the 70 courses with 100 or more graduates were used in the study.

Uncorrected correlation coefficients (Rs) were computed between the Air Force ASVAB aptitude indexes (AIs) the AFQT, and final technical training grades in each of 70 technical training courses. For each technical school, whenever possible, comparisons were made among nine subsamples: Total group, Males, Females, Whites, Blacks, White Males, Black Males, White Females, and Black Females.

The uncorrected correlation coefficients between the mechanical AI and Final School Grades for courses in the Mechanical cluster ranged from .16 to .52 with a median value of .41. For the Electronics AI, these correlations ranged from .36 to 60 (median .47). For the General and Administrative AIs, ranges were .32 to .59 (median .38) and .15 to .41 (median .29), respectively. Males and Whites tended to perform better than females and Blacks in most technical training courses. The AFQT was found to add very little to the selector AI in predicting final course grade in the General and Electronics courses, but it improved the prediction in the Mechanical and Administrative courses. The data suggested that the Administrative AI could be improved materially by a revision of its content.

Appendices to the paper provide regression information for predicting final school grades, in each course separately, from the selector AI and from the AFQT. (Author)

STUDY IDENTIFIER: AF84002
Skinner, M. J., & Alley, W. E. (1984). Performance of retrained airmen in Air Force technical schools (revised) (AFHRL-TR-83-18, AD-A138 173). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Research was conducted to determine the effect of changing occupational specialties on the performance of Air Force retrained enlistees attending basic technical schools. The academic performance and attrition rates of approximately 20,000 retrainees and 230,000 non-prior-service enlistees (non-retrainees) attending 272 schools were compared. Schools were categorized by selector aptitude index requirements into 18 subgroups for analysis. Data were compiled from historical personnel records. Multiple linear regression analyses examined the relationship between school performance criteria and retraining status and aptitude as well as the amount of military service, career status, and background experience acquired prior to retraining for each subgroup.

Results indicated that the performance of retrainees was comparable or superior to non-retrainees with equivalent aptitudes. Further, among retrainees performance generally increased as more time was spent in military service before changing specialties. Retrainees who were career airmen with more than three years of service tended to do better than non-career airmen in training. Results also indicated that experience in a specialty with the same aptitude index (Mechanical, Administrative, General, or Electronics) as the retraining specialty typically facilitated performance. A characteristic increasing relationship between aptitude and success in technical training was found. Potential research applications to retrainee selection and assignment procedures were considered. (Author)

STUDY IDENTIFIER: AF84003
Skinner, M. J., & Alley, W. E. (1984). Job aptitude requirement waivers for retrained airmen (AFHRL-TR-83-42, AD-A139 625). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

The viability of current Air Force policy to waive 10 points of the minimum job entry aptitude requirement for airmen retraining from one occupational specialty to another was evaluated. Optimum trade offs between aptitude discounts and performance achievements were examined for retrainees through performance comparisons with new recruits (non-retrainees) in entry-level technical training. Academic achievement and attrition rates were examined for 19,885 retrainees and 231,317 non-retrainees attending 272 technical schools. The specialties were categorized for analysis into 18 subgroups based on common mandatory aptitude prerequisites. Multiple linear regression analyses were used to explore the relationships among performance criteria, retraining status, and aptitude predictors in each subgroup. Performance differences for retrainees and non-retrainees at various aptitude levels were then evaluated. Overall, the results supported the 10-point waiver practice for retrainees. The implications for retrainee management of instituting a more liberal policy are discussed. (Author)

STUDY IDENTIFIER: AF85001
Park, R. K., Mathews, J. J., & Ree, M. J. (1985). English Diagnostic Test: Validation for journalism-related programs (AFHRL-TP-85-8, AD-A155 734). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This paper presents the results of an investigation into the predictive validities of the English Diagnostic Test (EDT). Data on the EDT were based on 228 enlisted service personnel enrolled in journalism-related programs. Multiple regression analyses were conducted for the Armed Services Vocational Aptitude Battery (ASVAB) composite test scores and the EDT raw scores, using final school grades as the dependent variable. The analyses show that the Air Force General test composite (GEN) (Arithmetic Reasoning, Word Knowledge, and Paragraph Comprehension) has higher predictive validity than the EDT or other service composite. A GEN cutoff score of the 67th percentile was recommended. (Author)

STUDY IDENTIFIER: AF85002
Hunter, J. E., Crosson, J. J., & Friedman, D. H. (1985). The validity of the Armed Services Vocational Aptitude Battery (ASVAB) for civilian and military job performance HQ USAF/MPXOA (Contract No. F41689-83-C-0025). Washington, DC: Department of Defense.

This study was conducted to determine the validity of the Armed Services Vocational Aptitude Battery (ASVAB) and specifically, the validity of the ASVAB high school occupational composites for predicting civilian job performance. Prior to this effort, ASVAB was never validated for civilian jobs. A meta-analysis, following the Schmidt-Hunter formulas, was used, with applications of reliability theory, confirmatory factor, multiple regression, and path analysis. Prior civilian job research, especially with the General Aptitude Test Battery (GATB), showed that Cognitive Ability rather than any specific aptitude, had the highest validity for most jobs and provided the causal link between the specific aptitudes and job performance. A confirmatory factor analysis on military validation produced an identical pattern of validity results. A psychometric comparison between ASVAB and the GATB revealed that ASVAB can duplicate the GATB Cognitive Ability composite but also improves on the GATB measure of Cognitive Ability. As a result, the GATB validity for civilian jobs represents only floor-level ASVAB validity for those same jobs. The ASVAB Cognitive Ability composite is highly valid for civilian jobs. In a separate meta-analysis, the ASVAB high school military job performance in their respective occupational areas. Since these composites are variations of the Cognitive Ability composite, their validity for their corresponding occupational areas in the civilian sector is close to that of the Cognitive Ability composite. However, they also predict very well in other occupational areas. Hence, little evidence for differential validity was found. Recommendations for future research in this area are included. (Author)

STUDY IDENTIFIER: AF85003

Prestwood, J. S., Vale, C. D., Massey, R. H., & Welsh, J. R. (1985). Armed Services Vocational Aptitude Battery: Development of Forms 11, 12, and 13 (AFHRL-TR-85-16(I), AD-A160 585). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This report describes the development of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 11, 12, and 13. The items for the new forms were supplied by the Air Force Human Resources Laboratory (AFHRL). They were administered to examinees in Recruit Training Centers (RTCs) along with items in the ASVAB 8b, a test battery parallel to the reference test used in this study, ASVAB 8a, as part of a previous research effort. Using the pretest data, eight new power subtests were constructed by matching classical item statistics for the new items to corresponding ASVAB 8b items. Comparisons of classical and item response theory (IRT) item statistics suggested that the newly developed subtests should be parallel among themselves and to ASVAB 8b.

Complete new ASVAB test batteries and ASVAB 8a were administered to examinees in RTCs using an equivalent-groups design. In addition, partial batteries of ASVAB Form 11a (judged to be the most "central" of the new forms) and ASVAB 8a were administered to examinees at Military Entrance Processing Stations (MEPS). The demographic statistics for the RTC and MEPS samples indicated that the assumptions of the equivalent-groups design were met. Summary score statistics were computed for each subtest administered in order to determine if like-named subtests were parallel. Classical item statistics and IRT parameters showed that the new subtests were more parallel among themselves than they were to the like-named ASVAB 8a subtests.

Linear and equipercentile equating tables were developed for the raw subtest scores using a 1980 weighted probability sample of American youth (males and females, ages 18-23) as the normative base. Two raw-score composites, Armed Forces Qualification Test (AFQT) and Verbal (VE), and 14 standard-score composites were also equated. Equating tables were developed for each of the six new forms administered in the RTCs and for the single form administered in the MEPS. Average linear and equipercentile tables were also developed from the RTC tables. Several statistics were used to compare the tables. These were the average bias, average absolute difference (AAD), and root mean square difference (RMSD) between table entries. Bias, AAD, and RMSD statistics weighted by the number of examinees corresponding to each entry in the table were also computed. Two linear tables were selected for operational use. For one form (ASVAB 12a), the table developed in the RTCs for that form was selected; and for the remaining five forms, the linear table developed in the MEPS (using ASVAB 11a) was selected.

Prior to October 1984, the ASVAB composites had a score scale referenced to the population of men serving during World War II (WWII). The WWII score scale was used continuously from about 1950 through 1 October 1984, when ASVAB Forms 8, 9, and 10 were replaced with ASVAB Forms 11, 12, and 13. With the implementation of ASVAB 11, 12, and 13, the normative base for the ASVAB score scale was changed from the WWII mobilization population of men to the 1980 weighted probability sample of American youth. Equating of the new ASVAB forms simultaneously accomplished two basic goals. First, the scores on the new test forms were made comparable; and second, the scores were scaled in relation to the wide range of abilities characteristic of the current mobilization population. (Author)

21

STUDY IDENTIFIER: AF86001

Wegner, T. G., & Ree, M. J. (1986). Alternative Armed Forces Qualification Test composites (AFHRL-TP-86-27, AD-A173 027). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Alternatives to the present Armed Forces Qualification Test (AFQT) composite, a subset of the Armed Services Vocational Aptitude Battery, were explored to examine the acceptability of a composite that did not include speeded tests. Fifteen alternative composites were analyzed for their predictive validity of training course scores, how their use would affect AFQT category classifications for different gender and ethnic subgroups relative to the present AFQT composite, and whether adequate pseudo-AFQT composites could be created to detect compromise. Results revealed some alternatives that compared favorably with the present AFQT composites on the different criteria. (Author)

STUDY IDENTIFIER: AF86002

Friedman, D., Crosson, J., Streicher, A., & Messersmith, D. (1986). The construct validity of the Armed Services Vocational Aptitude Battery (ASVAB) Form 14: A comparison with CAT, DAT and FIT/FACT (Unpublished report). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This project, part of the ongoing ASVAB research program, demonstrates the construct validity of ASVAB. ASVAB Form 14 was administered together with one of three commercially produced test batteries in selected high schools around the country. The three commercial test batteries were the California Achievement Tests (CAT), the Differential Aptitude Tests (DAT) and a combination of the Flanagan Industrial Tests and the Flanagan Aptitude Classification Tests (FIT/FACT).

Descriptive statistics as well as correlation coefficients were computed and are presented by gender and by grade. In addition to subtest correlations, the commercial battery subtests were correlated with five ASVAB composites and the AFQT. Factor analyses performed on each combination demonstrated the similarity of the underlying traits. Item characteristics curves were estimated for the ASVAB power subtests and the like-named subtests in the commercial batteries. Equipercentile equatings with the most highly correlated subtest in each commercial battery are provided for each ASVAB subtest and composite by grade and by gender. Subtest scores for ASVAB and each of the commercial batteries were predicted from each other using multiple linear regression techniques. These prediction equations were computed by grade and gender. (Author)

STUDY IDENTIFIER: AF87001

Stoker, P., Hunter, D. R., Batchelor, C. L., & Curran, L. T. (1987). Air Traffic Controller trainee selection (AFHRL-TP-87-19, AD-A187 497). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

The purpose of this effort was to examine new and existing selection procedures for entry into Air Traffic Control Operator School, in an effort to reduce the high level of attrition during and after training. The existing selection measures were the General Aptitude Index (AI) and Administrative AI from the Armed Services Vocational Aptitude Battery (ASVAB). New tests that were examined included the Multiplex Controller Aptitude Test (MCAT),

Object Completion Test (OCT), Rotated Blocks Test (RBT), Perceptual Abilities Test (PAT), and Electrical Maze Test (EMT). First, the relationships between ASVAB AIs and training performance were assessed. It was found that the Administrative AI had a smaller relationship with training performance compared to the General, Mechanical, and Electronics AIs which correlated well with the criteria. Second, the five new tests were administered and the test scores were compared to a dichotomous pass/fail criterion. Multiple regression analyses showed that the combination of MCAT and RBT yielded the best combined prediction and that their use would improve upon prediction made by using the ASVAB alone. In conclusion, the results of this investigation indicated that the General AI is a useful predictor of air traffic controller training performance and that the Administrative AI should be deleted as a selection requirement for entry into Air Traffic Control Operator School. Further, other tests, not included in the ASVAB, could make a significant contribution to the prediction of air traffic controller training outcomes. (Author)

STUDY IDENTIFIER: AF87004

Mumford, M. D., Harding, F. D., Fleishman, E. A., & Weeks, J. L. (1987). An empirical system for assessing the impact of aptitude requirement adjustments on Air Force initial skills training (AFHRL-TR-86-19, AD-A184 496). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Labortory.

Research was undertaken to develop a system for predicting the impact of aptitude requirement adjustments on Air Force initial-skills training. To accomplish this objective, a multivariate modeling approach was employed. Initially, interviews were conducted with a variety of technical training personnel to identify significant student input, course content, and training outcome variables. Measures of the identified variables were then formulated on the basis of personnel records and routinely available training documents. Subsequently, measures of the variables were obtained for 39 initial-skills courses and some 5,000 trainees. Information obtained from the interviews and the relationships observed among these variables gave rise to a hypothetical model of initial skills training, which was then validated through a formal path analysis. The resulting model accounted for a large amount of the variation in training outcomes and was found to yield path coefficients that were highly interpretable in predicting training outcomes. When cross-validated using a sample of nine additional training courses including approximately 1,000 trainees, the model yielded predicted training outcomes which were consistent with actual training outcomes. The implications of model components for understanding resident initial-skills training are discussed, along with potential applications of the model for personnel and training management. (Author)

STUDY IDENTIFIER: AF88001

Armstrong, T. R., Chalupsky, A. B., McLaughlin, D. H., & Dalldorf, M. R. (1988). Armed Service Vocational Aptitude Battery: Validation for civilian occupations (AFHRL-TR-88-20, AD-A198 758). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Form 14 of the Armed Services Vocational Aptitude Battery (ASVAB) is used in the Department of Defense high school testing program. Researchers have criticized the use of the ASVAB for career counseling in high schools because of a lack of validity data from studies of civilian occupations. To help counter the criticism, the American Institutes for Research undertook a project to validate ASVAB Form 14 on 12 common civilian

occupations. ASVAB scores were obtained from 1,328 individuals across the nation who had been employed in one of the 12 occupations for at least 3 months. Holding a job, rather than job performance, was used as the criterion. Analyses focused on the extent to which skills measured by ASVAB vary among the 12 civilian occupations. There was a statistically significant variation is ASVAB profiles among occupations. The most salient dimension of variation was defined by high scores on Auto and Shop Information and low scores on the Verbal composite. The 12 occupations grouped into six clusters. About 30% of cases could be accurately placed in their occupations using ASVAB information, compared to a chance level of 12%. Because criterion performance data were not available, there is no evidence that skills characteristic of membership in the occupations are the same as skills required for successful careers in the occupations. (Author)

STUDY IDENTIFIER: AF88002
Alley, W. E., Treat, B. R., & Black, D. E. (1988). Classification of Air Force jobs into aptitude clusters (AFHRL-TR-88-14, AD-A206 610). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Each military service groups its entry-level jobs into clusters based on similarity of aptitude requirements. The configuration of these systems differs by service. The Air Force has four job clusters, labeled Mechanical-M, Administrative-A, General-G, and Electronics-E, which have been used in only slightly modified form since the early 1950s. The purpose of this report is to describe results from an application of a new procedure for homogeneous clustering of regression equations in an Air Force Armed Services Vocational Aptitude Battery (ASVAB) validity study involving 155,000 recruits in 211 technical training programs. Empirical clusters are derived and explained in terms of specialty composition and aptitude profiles. Other potential applications of the procedure are briefly discussed. (Author)

STUDY IDENTIFIER: AF88003
Linn, R. L., Hastings, C. N., Hu, P. G., & Ryan, K. E. (1988). Armed Services Vocational Aptitude Battery: Differential item functioning on the high school form (AFHRL-TR-87-45, AD-A913-693). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This report documents results of a study of differential item functioning (also known as item bias) for the eight nonspeeded subtests of the form of the Armed Services Vocational Aptitude Battery currently used in the Department of Defense Student Testing Program. Twenty-seven different indices were calculated for each of the 200 items on the eight subtests for comparisons of item functioning for White and Black examinees, White and Hispanic examinees, and male and female examinees. Based on theoretical considerations and empirical results from this and previous research, three indices were emphasized. Items that were consistently classified as favoring one group in comparison to another group after controlling for overall performance were reviewed. None of the items on the two quantitative subtests was identified as functioning differently. On the other subtests, some items were identified as favoring one group while other items favored the second group in each of the gender and racial/ethnic group comparisons. Limited generalizations concerning the content characteristics of the identified items were suggested. (Author)

STUDY IDENTIFIER: AF88004

Andberg, M. A., Stillwell, W. G., Prestwood, J. S., & Welsh, J. R., Jr. (1988). Initial operational test and evaluation (IOT&E) of ASVAB Forms 11, 12, and 13: Parallelism of the new forms (AFHRL-TR-87-65(I), AD-A198 459). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Six new forms of the Armed Services Vocational Aptitude Battery (ASVAB) were developed and implemented on 1 October 1984. Between 1 October and 30 November 1984, these new forms and a reference form were administered to approximately 120,000 applicants to the U.S. Armed Forces. Test data were analyzed to assess the parallelism of the new forms in the total sample of applicants who were tested during October and November 1984 and in separate male and female applicant samples. The distributions of subtest scores, the item statistics, and the interrelationships of the subtest scores were compared across the forms.

There was some evidence of lower subtest mean scores on Form 12a, although this difference was not consistent for all subtests. Although results differ between the male and female samples, these differences did not appear to be systematically related to the form being administered and thus were not indicative of a sex-by-test-form interaction. (Author)

STUDY IDENTIFIER: AF88005

Palmer, P., Hartke, D. D., Ree, M. J., Welsh, J. R., Jr., & Valentine, L. D., Jr. (1988). Armed Services Vocational Aptitude Battery (ASVAB): Alternate forms reliability (Forms 8, 9, 10, and 11) (AFHRL-TR-87-48, AD-A191 658). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

This project investigated the alternate forms reliability of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, 10, and 11. High internal consistency reliability coefficients had been previously obtained and reported; however, coefficients of equivalence had not been studied. The direct calculation of parallel forms reliability was precluded; therefore, the alternate forms reliability coefficients of Form 11a with Forms 9a, 9b, 10a, and 10b were calculated. Then the alternate forms reliability coefficients of Form 8a with Forms 9a, 9b, 10a, and 10b were calculated. Alternate forms reliability of Form 11a with Form 8a was inferred. High reliability coefficients were expected, and this expectation was substantiated. (Author)

Two studies were conducted to examine the role of general and specific ability in predicting performance in military technical training. The first was a principal components analysis and the second was a series of regression using principal component scores as predictors and final school grades from technical training as the criterion.

The ten principal components of the Armed Services Vocational Aptitude Battery (ASVAB) were found on a nation-wide representative sample of American youth. Weights derived from this analysis were used to compute principal component scores for over 78,000 subjects in Air Force technical training in 89 jobs. The first principal component was g and some of the other components were interpreted.

Using Final School Grades as the criterion, multiple regressions were computed to determine if g was a potent predictor for all jobs and if predictive accuracy would increase if other principal components were added to the prediction. The regressions were computed in both uncorrected and corrected form to properly estimate the R^2s.

For each of the 89 jobs the first principal component, g, was the most potent predictor but for about three quarters of them addition principal components increased the coefficient of multiple correlation. The magnitude of the increase in R^2 was estimated to be about .022 on average. (Author)

III. UNITED STATES ARMY

STUDY IDENTIFIER: AR69001
Maier, M. H., & Fuchs, E. F. (1969). Development of improved aptitude area composites for enlisted classification (BESRL-TR-1159, AD-701 134). Alexandria, VA: Army Research Institute, Behavioral and Social Sciences Research Laboratory.

In response to special requirements of Deputy Chief of Staff for Personnel and United States Continental Army Command, BESRL's DIFFERENTIAL CLASSIFICATION Work Unit has conducted research to develop new and improved aptitude area composites based on the Army Classification Battery (ACB) test scores for use in determining assignment of enlisted input to training courses. Nearing completion is a large-scale validation study of operational and experimental measures conducted across a full range of the Army's Military Occupational Specialties (MOS). The ACB measures were evaluated for effectiveness as predictors of final grades in Army school training courses and performance in Army combat job assignments. Eight new aptitude area composites using only the ACB tests were developed. Simulated allocation studies were conducted to determine how much the new composites would improve classification of men for training and jobs. These composites and benefits to be derived from their use--specifically, enhancement of productivity of enlisted men in training assignments--are described in the present report. With the revised aptitude area system, benefits would accrue to the Army in 1) reduction by about 20% in the number of training school failures; 2) a concomitant savings in training funds and fuller utilization of Army training resources; 3) improvement in training performance of men completing training successfully--the number of men performing at marginal level would decrease by about 10% and an increased number would perform at superior level. Details of the data collection, statistical analysis and the results are presented in the Technical Supplement section of the report. (Author)

STUDY IDENTIFIER: AR70001
Frankfelt, E., & Maier, M. H. (1970). Comparison of ACB and ASVAB clerical tests for use in the Army Qualification Battery (Tech. Rep. BESRL-RM-70-6). Arlington, VA: Army Behavior and Systems Research Laboratory.

The goal of this study was to determine the feasibility of substituting the Coding Speed subtest from the ASVAB for the Army Clerical Speed Test (ACS) that, at the time, formed part of the Army Classification Battery or the Army Qualification Battery (AQB).

The two clerical predictor tests were administered to 460 Army recruits enrolled in the Clerk General Course at Fort Jackson, South Carolina. Criterion information was gathered for all students (final school grades).

ASVAB Coding Speed was found to be more valid than either the ACS total score or part scores from the ACS. In addition to absolute validity, the unique validity contributed by the ASVAB CS was also examined.

The Coding Speed subtest was found to be more valid than the ABC Clerical test for prediction of success in training for the Clerk General MOS. Because of greater ease of scoring and administration of the ASVAB CS, it was concluded that it would be logical and appropriate to substitute it for the ACS in the AQB. (Contractor)

STUDY IDENTIFIER: AR72001
Maier, M. H., & Fuchs, E. F. (1972). Development and evaluation of a new ACB and Aptitude Area System (TR-239, AD-751 761). Arlington, VA: Army Behavior and Systems Research Laboratory.

Army personnel managers have a continuing need to select, classify, and assign to training and jobs large numbers of men who enter the service. Since the Army Classification Battery (ACB) is an integral part of the assignment process, accuracy of scores has a significant influence on the appropriateness of assignment. BESRL's DIFFERENTIAL CLASSIFICATION Work Unit has an ongoing research program to keep the classification battery effective and up to date. As part of the overall effort, a new ACB and aptitude area system have been developed which result in an improved system of classification for training and jobs. The description of the new psychological test battery and aptitude areas and an assessment of their effectiveness in relation to the utilization and performance of Army enlisted input is given in Technical Research Report 1177. The present publication deals with BESRL research conducted to evaluate a large number of tests as predictors of success in the different groups of Military Occupational Specialties (MOS) and to select tests for aptitude area composites.

Experimental tests and tests of the operational ACB(administered to about 25,000 men in over 100 MOS training courses) were evaluated against performance in the training courses. Validity coefficients of the variables with final course grades in the MOS courses were computed and corrected to reflect population values. Regression equations for all tests were computed in each MOS sample, and for each MOS group a sequence of test selections was performed to determine which test contributed significantly to validity. These statistical analyses resulted in a test battery of 16 measures and the formulation of 9 aptitude areas designated as selectors for 9 MOS groups. Each aptitude area consisted of from three to five tests, each unit-weighted. Finally, through simulation runs, estimates were derived of operational effects of introducing the new classification system.

Findings indicate the new Army Classification Battery and aptitude areas to be superior to the previous system. Average validity of the new aptitude area composites across all MOS groups is higher than that of the previous composites. Supporting statistical analyses are provided in detailed tables in appendixes to the Research Note. (Author)

STUDY IDENTIFIER: AR74001
Maier, M. H., & Fuchs, E. F. (1974). A Comparison of three-subtest AFQT and four-subtest AFQT (ARI-RM-74-5). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

Deletion of 25-item Tool Knowledge subtest from the proposed AFQTs 9 & 10, the ACB and the NBTB gave rise to concern about the effects on test performance of low-scoring applicants to the Armed Services, since the lower scoring applicants typically scored higher on Tool Knowledge. This study examined score distributions for three- and four- subtest AFQTs in order to determine the effects of deleting the Tool Knowledge subtest.

A large sample of applicants administered the three subtest AFQT at AFEES in 1972 was compared to the same sample of applicants who were also administered four- subtest AFQTs. An additional smaller sample of Army recruits was also administered the ACB in addition to the three- and four- subtest AFQTs in order to estimate the relationship of the ACB AFQT to those AFQTs.

The sample of men used in this study tended to have similar score performance on the three- and four- subtest AFQTs. There were no systematic differences between the two AFQTs.

The two AFQT score distributions were sufficiently similar. No systematic differences were noted throughout the range of both the three-subtest AFQT and the four-subtest AFQT. (Contractor)

STUDY IDENTIFIER: AR78001
Maier, M. H., & Fuchs, E. F. (1978). Differential validity of the Army aptitude areas for predicting Army job training performance of Blacks and Whites (TP-312). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

Aptitude area scores of the Army Classification Battery (ACB) are part of the Army selection and classification procedure to determine which applicants for enlistment are accepted and which Army job training programs are open to them. The validity of the current aptitude area measures were assessed by a step-by-step analysis comparing aptitude area scores and job training scores (final course grades) for 12,355 whites and 1,772 blacks. Results showed that aptitude area scores correlated highly with training scores for both blacks and whites. For six of the eight major job areas for which white-black identification was available, both white and black trainees were selected appropriately for their job categories. (Author)

STUDY IDENTIFIER: AR79002
Fischl, M. A., Ross, R.M., & McBride, J. R. (1979). Development of factorially based ASVAB high school composites (Tech. Paper No. 306, AD-A072 315). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

The Armed Services Vocational Aptitude Battery (ASVAB) is used for selection and classification purposes by the military services and for vocational guidance in high schools. The purpose of this research was to improve score composites for the specific use of vocational guidance in the high schools.

Factor analysis was used to cluster the tests into composites based on the underlying dimensions of ability in the ASVAB. A principal factor solution was rotated to simple oblique structure to achieve the following five ability factors: verbal, analytic/quantitative, clerical, mechanical, and trade technical. These factors have high reliability and relatively low intercorrelations. One last score test composite, called academic ability, was added to the factorially based composites as an indicator of the ability to succeed at further school or formal training.

The report is written primarily for scientific investigators in psychometrics. (Author)

29

STUDY IDENTIFIER: AR80001
Fischl, M. A., & Ross, R. M. (1980). Enhancing quality control in the testing of military applicants (ARI-TR-384). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

Diverse sources of error must be controlled for aptitude tests to have substantial validity. This paper describes a highly cost effective procedure for immediate verification of the veridicality of operational test scores.

A continuous need exists to maintain the high quality of testing procedures and of operational test scores used in selecting and classifying enlisted personnel. In a large-scale testing program such as the one that uses the Armed Services Vocational Aptitude Battery (ASVAB), the risk of test compromise is always present. A cost effective procedure for detecting the incidence of spurious scores was developed consisting of (a) comparison of scores on two ASVAB subtests to detect any large differences between them, (b) administration of a 10-minute retest to examinees showing the large difference, and (c) comparison of original and retest scores to verify the incidence of likely test compromise. Tryout of the procedure indicated that the 10-minute retest of fewer than 20% of all examinees could detect approximately 70 % of all cases of test compromise. (Author)

STUDY IDENTIFIER: AR80002
Eaton, N. K., Johnson, J., & Black, B. A. (1980). Job samples as tank gunnery performance predictors (TR-NO 473). Fort Knox, KY: Army Research Institute for the Behavioral and Social Sciences.

This research was conducted to develop and evaluate job samples as predictors of tank gunnery performance. In Phase I of the research two potentially useful job sample predictors were identified and validated. Phase II results provided cross-validation of these predictors. Subjects in Phase I & II consisted of recent Armor OSUT graduates. Approximately one-half the subjects in Phase III were administered the job sample tests during their eighth week of training while the remaining one-half were tested at the Fort Knox Reception Station, i.e., prior to training. Phase III results demonstrated that feedback had no effect on job sample-tank gunnery relationships; however, level of prior training did have an effect. Eight week personnel performed at a higher level than Reception Station personnel on most job sample tasks. Results suggest that the job samples evaluated here offer promise in predicting performance after initial training and may be adaptable for use with the operational unit assignment process. (Author)

STUDY IDENTIFIER: AR81001
Maier, M. H., & Grafton, F. C. (1981). Aptitude composites for ASVAB Forms 8, 9, and 10 (Research Report 1308). Alexandria VA: Army Research Institute for the Behavioral and Social Sciences.

Aptitude composites for the Armed Services Vocational Aptitude Battery (ASVAB) were developed using training success and Skill Qualification Test (SQT) scores, measures of job proficiency, as the criterion. The aptitude composites had high validity in the range .52 to .75 for predicting job proficiency. Criticisms of the usefulness of SQTs as measures of job proficiency are addressed. (Author)

STUDY IDENTIFIER: AR81002

Fischl, M. A. (1981, October). Soldier reading ability: The advocacy point of view. Paper presented at the Annual Conference of the Military Testing Association, Washington, DC.

The purpose of this very brief report was to show that there may not be as severe a "literacy" problem in the Armed Forces as suggested by recent anecdotal evidence. The report shows that because of very high correlation (.90) of the ASVAB with the Metropolitan Reading Achievement Test, many illiterate applicants may not pass the primary screening test for entry into the Armed Services unless there was widespread compromise. (Contractor)

STUDY IDENTIFIER: AR81004

Shields, J. L., Hanser, L. M., Williams, E. W., & Popelka, B. A. (1981, October). Pilot research for validation of ASVAB (Armed Services Vocational Aptitude Battery) and enlistment standards against performance on the job (AD P001 374). Paper presented at the Annual Conference of the Military Testing Association, Washington, DC.

The Army Research Institute (ARI) conducted an initial pilot research project in the 193rd Infantry Bridage, Panama to determine the feasibility of validating the Armed Services Vocational Aptitude Battery (ASVAB) and enlistment standards against performance on the job. This report discusses some preliminary analyses of these data. The preliminary analyses [sic] focus on two areas. The first area deals with the definition of a "successful soldier," and the extent to which commanding officers and NCO's agreed on the qualities of a successful soldier. The second area deals with the relations among ASVAB 5/6/7, SQTs, and selected preliminary measures of job performance. The results suggest that the three most important factors in overall soldier performance as indicated by supervisor consist of job performance, troop responsibility, and discipline. The relationship between ASVAB and existing measures of job performance (e.g., SQT scores, awards, honor graduate, and letter of appreciation) are also discussed. (Author)

STUDY IDENTIFIER: AR82002

Armor, D. J., Fernandez, R. L., Bers, K., Schwarzbach, D. S., Moore, S. C., & Cutler, L. E. (1982). Recruit aptitude and Army job performance: Setting enlistment standards for infantrymen (R-2874-MRAL). Santa Monica, CA: Rand Corporation.

An improperly calibrated Armed Services Vocational Aptitude Battery (ASVAB) used between 1976 and 1980 produced inflated test scores for many applicants seeking military enlistment. In effect, the calibration error lowered enlistment standards and led to increased enlistment of low-aptitude personnel, many of whom would not have qualified with a correctly calibrated test. These low-ability recruits, called "category IV," are below the 30th percentile in general aptitude compared with the World War II mobilization population, and represent the lowest category allowed to enlist.

The calibration error was corrected for the 1981 fiscal year, but meanwhile the Army had experienced the largest influx of low-aptitude recruits among the services. This event raises three important policy questions, each of which is investigated in this report. First, what is the magnitude of this decline in Army recruit aptitude levels, and how does it compare with

aptitude levels during the draft years? Second, how has this decline affected job performance and, hence, manpower effectiveness? Third, will higher aptitude standards for the Army be cost-effective, and, if so, how costly will these standards be?

The first question is answered by comparing recent Army recruit aptitude levels with those obtained during the 1960s when the draft was in effect. We find that, between 1976 and 1980, nearly one-half of all Army recruits fell into category IV. During the peacetime draft years, this proportion varied around an average of 20 percent. In other words, lowest-aptitude recruits more than doubled during the last half of the 1970s. Moreover, the proportion of highest-aptitude recruits (categories I and II, the top 35 percent of the general youth population) fell from around one-third to about 15 percent by 1980. Following adoption of a new and correctly calibrated aptitude test in late 1980, Army category I and II recruits climbed to 25 percent, while category IV recruits dropped to 31 percent for the 1981 fiscal year.

The effect of declining aptitude levels on job performance was evaluated by means of standardized on-the-job proficiency tests, which assess the extent to which enlisted personnel possess skills essential for specific Army jobs. Compared with higher-ability Army recruits, lower-aptitude recruits are much more likely to fail these on-the-job performance tests across a wide range of Army jobs, including combat arms specialties. Therefore, the declining aptitude levels in recent years have lowered Army manpower effectiveness by enlisting larger numbers of personnel who are unable to meet minimum skill requirements.

Given the relationship between aptitudes and job performance alone, the higher aptitude standards adopted by the Army in 1980 would clearly seem desirable. These standards follow a Congressional mandate setting a maximum of 25 percent category IV recruits for 1982 and 20 percent in future years. The final policy questions, then, become whether these new standards will be cost-effective in an All-Volunteer Army, and how much it will cost the Army to meet them. This report attempts to answer these questions by developing a methodology for determining optimal aptitude mixes according to cost-effectiveness criteria.

The central component of this methodology is a cost-performance model that compares the total cost of recruiting and maintaining first-term enlisted personnel of varying quality mixes for a given Army job. The quality mix varies according to AFQT distribution, high school status, and the aptitude score requirements for entrance into a given job. The model is applied to the Army Infantryman specialty for illustrative purposes. The results for Army Infantrymen show that the model can generate a series of optimal aptitude mixes for various recruiting-cost assumptions. Generally speaking, the model shows that optimal aptitude mixes require a higher proportion of high-aptitude recruits than were enlisted between 1976 and 1980. Under the smallest of three recruiting-cost assumptions, the optimal standards are even somewhat higher than the new Infantry standards adopted for the 1981 fiscal year.

Assuming that present manning levels remain constant, raising ability standards will increase recruiting costs substantially. Although the recruiting-cost estimates need further refinement, preliminary estimates suggest that optimum ability mixes might cost the Army between $100 and $200 million per year in extra recruiting costs, either in the form of additional recruiters or in the form of enlistment bonuses or other enlistment incentives. Such expenditures would deliver only 7,000 additional high-ability men, out of an estimated 105,000 Army non-prior-service male accessions in 1981. If the Congressional mandate were applied to all Army jobs, this increment could rise to 10,000 or 12,000 high-ability

recruits (or more) at an increased cost on the order of $280 to $370 million per year. Moreover, as the plans to increase the size of the Army, the competition for high-ability personnel may become even more intense. Recruiting costs may then have to rise even further to attract enough persons to meet these new ability standards.

Not withstanding these seemingly high costs, this study has shown that higher ability standards make sense. Two points must be kept in mind. First, the additional costs are only a small increment to the total cost of recruiting and maintaining the first-term force; in the percent increase in total force costs. Second, the return that these additional expenditures will yield is a substantially more capable force; the optimal mix would yield 10 percent more working-months contributed by Infantry men who are able to meet the minimum job performance standard. Higher standards ensure that more of the Army's recruits are able to perform their jobs adequately, reduce the cost of obtaining each month of qualified job performance, and hence may justify the costs they impose. (Author)

STUDY IDENTIFIER: AR82003

Kass, R. A., Mitchell, K. J., Grafton, F. C., & Wing, H. (1982). Factor structure of the Armed Services Vocational Aptitude Battery (ASVAB), Forms 8, 9, 10: 1981 Army sample (TR-581). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

The purpose of this paper is to examine the factor structure of the Armed Services Vocational Aptitude Battery (ASVAB), Forms 8, 9, and 10. This standardized multiple cognitive abilities battery is the primary selection and classification instrument used by all military services. It consists of eight power and two speed tests. This investigation compared the ASVAB 8/9/10 factor structure to the factor structure observed for previous samples and previous forms of the ASVAB; it examined the similarity of ASVAB factor structure for racial/ethnic and sex subgroups. A factor analysis of a sample of 98,689 male and female Army applicants yielded four orthogonal factors accounting for 93% of the total variance: Verbal Ability, Speeded Performance, Quantitative Ability, and Technical Knowledge. Factor analyses of male, female, white, black, and Hispanic subgroups yielded similar results. (Author)

STUDY IDENTIFIER: AR82005

Campbell, C. H., & Black B. A. (1982). Predicting trainability of M1 crewmen (TR-82-592). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

The purpose of this research was to examine ASVAB and non-ASVAB measures as potential predictors of M1 training performance. Ten subtests, the aptitude area scores CO and GT, and AFQT were taken from the ASVAB. Five variables tapped the soldiers' backgrounds and personal characteristics. Five job sample tests were also used: tracking, target acquisition, fire control computer, use of the TM, and round sensing. Criteria included OSUT GATE scores, time and accuracy (hits) on firing of Table VII and instructor ratings of trainees, as well as two composite criteria. Data collection was conducted among 146 soldiers in the first two M1 OSUT classes at Ft. Knox. The analysis involved a series of multiple regression, first on the ASVAB subtests and then on the remaining measures. Regression equations that reliably predicted criteria were cross validated between OSUT using both regression weighted and unit weighted models.

ASVAB subtest scores were examined to determine: 1) if the aptitude area scores CO and GT were predictive of M1 OSUT soldier performance and 2) to ascertain whether or not a new combination of subtests might improve upon CO, the current Armor selector. Finally, job sample test scores were evaluated to determine if their inclusion in a composite predictor with CO would result in a significant improvement in predictability above that from CO alone. Results of regression analyses demonstrated that CO predicted M1 OSUT performance in both samples while GT did not, a new combination of subtests had validity coefficients equivalent to those of CO in each company and were apparently more consistent in strength, and job sample tests while consistently identified as predictors, did not significantly improve upon the correlation obtained from CO alone. Consideration of the results of this research should be tempered by the understanding that moderate sample sizes were involved, no academic failures occurred in either OSUT company and criterion measures most appropriate to the validation of the job sample tests were not available. (Author)

STUDY IDENTIFIER: AR82006
McCormick, B. K., Dunlap, W., Kennedy, R., & Jones, M. (1982). The effects of practice on the Armed Services Vocational Aptitude Battery (ARI-TR-602). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

The Armed Services Vocational Aptitude Battery (ASVAB) was administered five separate times to fifty-seven men and women of military service age. The objective was to determine to what extent means and cross-session correlations are stable over sessions. Ten individual subtests, the derived ASVAB area composites (n = 10) and the Armed Forces Qualification Test (AFQT) were examined for stability. The means and dispersions of scores for this population were below the national average. Means increased over sessions .5 standard deviations or more on half the subtests and consequently on most of the composite scores. Correlations for the composites were largely stable over sessions. Correlations between composites were generally lower than within composites. The implications of practice effects for paper and pencil as well as automated selection tests are discussed. (Author)

STUDY IDENTIFIER: AR83001
Martin, C. J., Rossmiessl, P. G., & Wing, H. (1983). Validity of cognitive tests as predictors in Army training success. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 211 - 219). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A792 and is being conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort. (Author)

STUDY IDENTIFIER: AR83002
McCormick, B. K., Dunlap, W. P., Kennedy, R. S., & Jones, M. B. (1983). The effects of practice on the Armed Services Vocational Aptitude Battery (ARI-TR-602). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

Alternate forms of the ASVAB were administered five separate times to fifty-seven men and women of military service age. The objective was to determine to what extent means and cross-session correlations are stable over several administrations. Ten individual subtests, the derived ASVAB composites and the Armed Forces Qualification Test (AFQT) were examined for stability. The means for this sample were below the national average and scores were less dispersed. Means increased over sessions .5 standard deviation or more on half the subtests and consequently on most of the composite scores.

Correlations for the subtests and the composites were largely stable over sessions and were slightly higher later in practice. Reliabilities were comparable to reference populations when adjusted for the range restriction of the present sample. The implications of practice effects for paper and pencil as well as automated selection tests are discussed. (Author)

STUDY IDENTIFIER: AR83003
Weltin, M. M., & Popelka, B. A. (1983). Evaluation of the ASVAB 8/9/10 clerical composite for predicting training school performance (ARI-TR-594, AD-A143 235). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

The composite of Armed Services Vocational Aptitude Battery (ASVAB) subtests used to select applicants for entry-level training in Army clerical schools was evaluated by correlating composite scores with training performance scores. The clerical composite (CL) had high validity (r = .68) for this criterion but an alternate composite of Arithmetic Reasoning, Paragraph Comprehension, and Mathematics Knowledge scores produced from multiple regression analyses had even higher validity (r = .74). Differential prediction for classification purposes is discussed. (Author)

STUDY IDENTIFIER: AR83004
Friedman, D., Streicher, A., Wing, H., Grafton, F., & Mitchell, K. (1983). Reliability of scores for fiscal year 1981 Army applicants: Armed Services Vocational Aptitude Battery Forms 8,9,10 (Research Note 85-48). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

Subtest scores achieved by enlistment accessions on the Armed Services Vocational Aptitude Battery (ASVAB) are used to select and classify applicants in Army Military Occupational Specialties (MOS). Research is underway to validate ASVAB scores for prediction of job performance in the Army. This report describes a research effort to evaluate the accuracy of recorded ASVAB subtest scores. The results of the reliability research indicate that reported scores were consistent with the ASVAB subtest scores computed by an independent contractor, using the same raw data. In addition, analyses were made of a sample of FY 1981 Army applicants who repeated the ASVAB, having failed to achieve the required cut-score on the first test. These applicants showed greatest improvement on the speeded subtests. (Author)

STUDY IDENTIFIER: AR83005
Rossmeissl, P., & Wise, L. (1983). Validation. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilizatior of Army enlisted personnel (pp. 311 - 466). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

During Project A's second year, the Longitudinal Research Database (LRDB) was expanded dramatically to provide a firm basis for validation research. The first major validation research effort was carried out using information on existing predictors and criteria in the expanded LRDB. The initial validation research led to proposed improvements in the Army's existing procedures for selecting and classifying new recruits. The proposed improvements were adopted after thorough review and are to be implemented at the beginning of FY85. In addition. a number of smaller research efforts were supported with the expanded LRDB.

In describing validation research results during FY84, we turn first to an overview of the growth of the LRDB. Next, we summarized the ASVAB Aptitude Area Composite research that was based on the expanded LRDB. We conclude with a brief description of other supporting analytic activities. (Author)

STUDY IDENTIFIER: AR83006
Rossmeissl, P. G., & Stern, B. M. (1983). The application of meta-analytic techniques in estimating selection/classification parameters. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 423 - 430). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A792 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers enlisted personnel are participating in this landmark effort. (Author)

STUDY IDENTIFIER: AR84001
McLaughlin, D. H., Rossmeissl, P. G., Wise, L. L., Brandt, D. A., & Wang, M. (1984). Validation of current alternative Armed Services Vocational Aptitude Battery (ASVAB) area composites, based on training and S\u Qualification Test (SQT) information on fiscal year 1981 and 1982 (ARI TR 651, AD-A156 807). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This report describes a large scale research effort to validate and improve the ASVAB aptitude area (AA) composites now used by the Army to select and classify enlisted personnel. Data were collected from existing Army sources on over 60,000 soldiers and over 60 MOS. The research had three major components: First, the composites now being used by the Army were validated. Second, a new set of composites were derived

36

empirically; and finally, both sets were compared on the basis of predictive validity, differential validity, and possible prediction bias. Both sets of composites were found to perform well, with the alternative set of four composites doing slightly better than the nine now in operational use. (Author)

STUDY IDENTIFIER: AR84002
Rossmeissl, P. G., & Brandt, D. A. (1984). Subgroup variation in the validity of Army aptitude area composites. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 361 - 412). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A792 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort. (Author)

STUDY IDENTIFIER: AR84003
Mislevy, R. J., & Bock, R. D. (1984). Item operating characteristics of the Armed Services Vocational Aptitude Battery (ASVAB), Form 8a (Contract No. N00014-83-C-0283). Washington, DC: Psychological Services Division, Office of Naval Research.

The Profile of American Youth study carried out in 1980 by the Department of Defense with the cooperation of the Department of Labor obtained responses from a national probability sample of young people between the ages of 16 and 23 to the tests of the Armed Services Vocational Aptitude Battery (ASVAB). This report contains the results of item analyses of the eight power tests of the ASVAB, based on a random sample of 1187 respondents from the Profile study. The 1-, 2- and 3-parameter logistic give item response models were fit to the data by marginal estimation methods. Indices of overall fit, item parameter estimates and their standard errors, item information indices, and test information and standard error curves are presented. (Author)

STUDY IDENTIFIER: AR84004
Hough, L., Dunnette, M. D., Wing, H., Houston, J., & Peterson, N. G. (1984). Covariance analyses of cognitive and noncognitive measures of Army recruits: An initial sample of preliminary battery data. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 271 - 306). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A791 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort.

This research was funded by the U.S. Army Research Institute for the Behavioral and Social Sciences, Contract No. MDA903-82-C-0531. All statements expressed in this paper are those of the authors and do not necessarily express tne official opinions or policies of the U.S. Army Research Institute or the Department of the Army. (Author)

STUDY IDENTIFIER: AR84005

McLaughlin, D. (1984). Differential validity of ASVAB for job classification. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 333 - 346). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A791 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort. (Author)

STUDY IDENTIFIER: AR84006

Brandt, D., McLaughlin, D. H., Wise, L. L., & Rossmeissl, P. G. (1984). Complex cross-validation of the validity of a predictor battery. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 347 - 360). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A792 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research

Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort.

STUDY IDENTIFIER: AR84007

Brandt, D., McLaughlin, D. H., Wise, L. L., & Rossmeissl, P. G. (1984). Adjustments for the effects of range restriction on composite validity. In N. K. Eaton, M. H. Goer, J. H. Harris, & L. M. Zook (Eds.), Improving the selection, classification and utilization of Army enlisted personnel (pp. 431 - 440). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper describes research performed under Project A: Improving the Selection, Classification, and Utilization of Army Enlisted Personnel. This nine year, large scale program is designed to provide the information and procedures required to meet the military manpower challenge of the future by enabling the Army to enlist, allocate and retain the most qualified soldiers. The research is funded primarily by Army Project Number 2Q263731A792 and is conducted under the direction of the U.S. Army Research Institute for the Behavioral and Social Sciences. Research scientists from the U.S. Army Research Institute for the Behavioral and Social Sciences, the Human Resources Research Organization, the American Institutes for Research, and the Personnel Decisions Research Institute as well as many Army officers and enlisted personnel are participating in this landmark effort. (Author)

STUDY IDENTIFIER: AR85001

Grafton, F. C., & Horne, D. K. (1985). An investigation of alternatives for setting second-to-third tour reenlistment standards (ARI TR-690, AD-A164 694). Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.

This paper was written in response to a request from the Office of the Deputy Chief of Staff for Personnel, Department of the Army. The task was to investigate the appropriateness of using the General Technical (GT) composite of the ASVAB as a reenlistment criterion. Three aptitude measures, all ASVAB composites, were compared to measures of proficiency in job performance: Armed Forces Qualification Test (AFQT), General Technical (GT), and the specific Aptitude Area (AA) composites. The GT is similar to the AFQT except for exclusion of a speed test. The AA composites are differential aptitude measures and would be expected to provide a better prediction of performance in specific military occupational specialties (MOS). The predictive ability of each of these composites was analyzed and the results compared. Job proficiency was measured by the Skill Qualification Tests (SQT).

The univariate and multivariate statistical methods used in this research demonstrated that all aptitude measures were significantly related to performance across MOS and skill levels. This is true even when variables measuring experience and education are included in the analysis. The specific AA composites generally predicted performance better than either AFQT or GT. The results suggest that, when no MOS-specific performance measures are available, AA scores are the preferable reenlistment criteria relative to either AFQT or GT scores. (Author)

IV. ARMED SERVICES

STUDY IDENTIFIER: AS69001
Office of the Secretary of Defense, Assistant Secretary of Defense. (1969). Project One Hundred Thousand: Characteristics and performance of "New Standards" men. Washington, DC: Author

From October 1966 until December 1969 the Department of Defense revised the enlistment qualification standards for entry into the Armed Services. The "new standards" men accepted into the Armed Services under this program would have otherwise been disqualified for failure to meet the mental aptitude standards and physical standards that previously obtained. The reasoning was that many of these men would become fully qualified servicemen where given the benefits of modern training and instructional techniques.

The report emphasizes that the new standards men are not "mentally retarded," but that their current military standards were considerably higher than they were in WWII and that productive use could be made of many such men in the military service in the 1966-1969 time frame. Training performance criteria were not lowered for these men, but rather, there were provisions at all stages of their training for giving them extra help in training to the appropriate criteria.

Given that this program was initiated during the draft era, broadening of the opportunities for voluntary enlistment reduced the draft calls somewhat. Results of accepting the new standards men were encouraging when this report was written. Ninety-four percent (94.6%) of the new standards men graduated basic training compared to 97.6% of the control group - though there was considerable variability by service (the low was 88.9% for the Marine Corps). Attrition for new standards men was 10% versus 4% from skill or specialty training. One finding of this study indicated that new standards men were more successful in "practical" specialties as opposed to those that required significant reading or mathematical skills. The more complex the job, the higher failure rate. (Author)

STUDY IDENTIFIER: AS80002
Office of the Assistant Secretary of Defense (MRA&L) (1980). Aptitude testing of recruits (Report to the House Committee on Armed Services). Washington, DC: Department of Defense.

On 19 February 1980, and 10 March 1980, Mr. Robert B. Pirie, Assistant Secretary of Defense (DoD) Manpower Overview Statement to both the House and Senate Committees on Armed Services. In it, Mr. Pirie informed the Committees that he had learned that there was a problem with the norming of the DoD enlistment eligibility test, and that the Services might be enlisting a higher percentage of low scoring individuals than was previously thought to be the case.

Norming is simply a method through which a test's raw scores converted to percentile scores. Raw scores on a test are by themselves of very limited usefulness. They must be "normed" against the scores of a defined and relevant population. In the case of the enlistment test, the Armed Services Vocational Aptitude Battery (ASVAB), the norms allow the Department of Defense to evaluate its new recruits across time and across Services. This is of particular importance when replacement tests are introduced, as they are

periodically. It the norms established for replacement tests inaccurately translate raw scores to percentile scores, the Department cannot evaluate effectively its new recruits against those who had served in the past. For that reason, it is imperative the test norms be accurate.

In its 30 April 1980 Report on Fiscal Year 1981 Dod authorizations, the House Committee on Armed Services expressed concern about the "discovery of the inadequacy of testing." The Committee asked the Department of Defense to present a comprehensive assessment of the extent of the norming problem. This report responds to that request. (Author)

STUDY IDENTIFIER: AS81002
Bock, R. D., & Mislevy, R. J. (1981). The Profile of American Youth: Data quality and analysis of the Armed Services Vocational Aptitude Battery. Chicago, IL: National Opinion Research Center.

The Profile of American Youth is the title given to a large-scale social research project sponsored by the Department of Defense with the cooperation of the Department of Labor. Its purposes were to assess the vocational aptitudes of contemporary American young people and, at the same time, establish current national norms for the Armed Services Vocational Aptitude Battery (ASVAB). To achieve these goals, the National Opinion Research Center (NORC) administered ASVAB 8A during the summer of 1980 to a national probability sample of nearly 12,000 men and women, ages 16 to 23.

Because of the importance of this study, not only to its sponsors but to the social science research community and the general public, care has been taken to examine and document the quality of the data collected. This review included the ASVAB's suitability for assessing the aptitudes of the 1980 youth population. Whether the data collected are appropriate for this purpose depends on (1) the adequacy of the sampling plan and its implementation; (2) the quality of fieldwork and test administration procedures; and (3) the psychometric quality of the test data collected. Two previously published reports examine and document findings relevant to these first two considerations (Frankel and McWilliams, 1981; McWilliams, 1980). The present report examines the psychometric quality of the test data themselves.

Using item response theory (IRT) methods, it investigates: (1) item response profiles of individual subjects for evidence of unusual patterns of right and wrong answers which may indicate carelessness, malingering, or guessing; (2) the possibility of test item bias that may favor one or another subcultural group; (3) the reliability of the ASVAB subtests and the amount of information they provide about subjects across the entire range of ability; (4) the consistency of test administration by NORC staff at the several hundred testing centers established across the country.

CONCLUSIONS:

Data from responses of the Profile of American Youth sample to the ASVAB are free from major defects such as high levels of guessing or carelessness, inappropriate levels of difficulty, cultural test-question bias, and inconsistencies in test administration procedures. They provide a sound basis for the estimation of population attributes such as means, medians and percentile point, for the youth population as a whole and for subpopulations defined by age, sex and race/ethnicity. (Contractor)

STUDY IDENTIFIER: AS82001
Office of the Assistant Secretary of Defense. (1982). A Report to the House Committee on Appropriations: First annual report to the Congress on Joint-Service Efforts to link standards for enlistment to on-the-job performance. Washington, DC: Office of the Secretary of Defense, Manpower, Reserve Affairs and Logistics.

In July 1980, the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) directed the Services to establish a research program to link enlistment standards directly to job performance. During hearings for the FY 1983 budget, the House Committee on Appropriations tasked the Office of the Secretary of Defense to provide direct oversight for Joint-Service research activities addressing job performance measurement and the eventual linkage of job performance data to enlistment standards. The Committee also requested OSD and the Services to document research progress in an annual report to the House and Senate Committees on Armed Services and Appropriations Beginning in December 1982.

The purposes of this report are to outline the actions taken to establish formal OSD oversight and to provide a review of past, present, and future Service research efforts addressing the development to job performance measures and subsequent attempts to link enlistment standards to job performance. Chapter One presents an historical background of events leading to the establishment of the Joint-Service Project while Chapter Two reviews OSD/Service actions taken to provide a management structure for Joint-Service activities. Chapters three through Six provide each Service's relevant research results and programs. A brief summary of near-term research and management efforts planned by OSD and the Services is provided in Chapter Seven. (Author)

STUDY IDENTIFIER: AS82002
Berger, F. R., Gupta, W. B., & Berger, R. M. (1982). The validity of ASVAB-5 in predictive vocational technical course success in secondary and post-secondary schools (TR-82-1). Los Angeles, CA: Psychometrics Inc.

The High School Testing Program offered by the Department of Defense involves the administration of the Armed Services Vocational Aptitude Battery (ASVAB) to approximately one million high school students per year. Over 40 years of research on various forms produced by the military services and civilian secondary and post-secondary schools are behind the content of the current battery, ASVAB Form 5. The more recent research has included comparisons with other well-established batteries, the GATB and DAT (Kettner, 1977) and validity studies (Bower, Lewis, and Krockover, 1975; Jensen and Valentine, 1976; Valentine, 1977; Berger, Berger, and Gupta, 1978).

The validity of vocational tests has become an increasingly public issue. The advent of government regulations that emphasize the requirement of content validity in tests has had the effect of increasing attention on the validity of aptitude tests as well as proficiency tests. To construct an aptitude test to be a job sample is difficult because the examinee usually has no experience of the job. Traditionally, then, aptitude tests, including the ASVAB, have used constructs such as mechanical, verbal and math ability to determine test content. Since the ASVAB depends on construct rather than content validity, it is important to investigate its criterion-related validity, particularly for reconfigured ASVAB composites which have not been substantiated by civilian validation. The purpose of this study was to validate the ASVAB-5 tests and composites using criteria of secondary and post-secondary vocational course grades.

The correlations for ASVAB composites ranged from -.04 to .52 for the various cours.. groups as compared to school grade criteria. Optimum weighted correlation of composites that predict school grade criteria ranged from .18 to .62 with a median of .54, for mixed sex samples, while optimum weighted multiple correlations for tests ranged from .22 to .67, with a median of .54, for mixed sex samples. Optimum weighted multiple correlations of composites for post-secondary courses ranged from .18 to .54, (median of .37), for mixed sex samples. The optimum weighted multiple correlations of tests for post-secondary courses ranged from .17 to .54, (median of .40), for mixed sex samples. This report describes data collection and analysis procedures, comparing the secondary and post-secondary school results. A method for predicting the grade point average of a course group is also outlined. (Author)

STUDY IDENTIFIER: AS82003
Office of the Assistant Secretary of Defense (MRA&L). (1982). <u>Conference on Joint-Service efforts to link enlistment standards and job performance</u>. Washington, DC: Department of Defense.

A kickoff meeting for the Joint-Service Job Performance Measurement Project was held at the Air Force Human Resources Laboratory, Brooks Air Force Base, Texas, on 28-20 September 1982. The objective of the meeting was to provide a forum in which to: (1) fully elaborate the concept, objectives, and status of the Joint-Service Job Performance Measurement Project; (2) present and discuss the proposed conceptual framework for this long-term project; and (3) review the status of relevant Army, Navy, Marine Corps, and Air Force research and development activities.

This report documents the results of the meeting and is organized to reflect the order of DoD and Service presentations (see Appendices for the agenda and a listing of participants).

Chapter Two provides a synopsis of comments made by Dr. G. Thomas Sicilia, Director, Accession Policy, Office of the Assistant Secretary of Defense (OASD/MRA&L) and a copy of the slides used during his briefing. Dr. Sicilia discussed the background of the Project and provided a conceptual/organization structure for Joint-Service planning and coordination of research and development efforts. Subsequent chapters provide a brief efforts, and future programmed studies. Slides used by each Service during the meeting accompany the reviews. Chapter Seven discusses differences in the research strategies proposed by the Services as presented at this meeting. The final chapter provides a point paper outline of comments made during the second-day session.

The first day of the meeting was an "open session" attended by Service behavioral science laboratory managers and scientists, Service policy staffers, and individuals from the civilian research community. The second day of the meeting was devoted to a discussion of each Service's current and projected funding and manpower to be dedicated to research addressing job performance measurement and detailed discussions aimed at determining Service opinions concerning various aspects of the conceptual framework presented during the open session. Attendance at the second-day session was therefore restricted to Service laboratory research personnel and policy staffers. (Author)

44

STUDY IDENTIFIER: AS82004
Office of the Assistant Secretary of Defense. (1982). <u>Profile of American Youth: 1980</u>
<u>nationwide administration of the Armed Services Vocational Aptitude Battery</u>. Washington,
DC: Department of Defense.

BACKGROUND

The Profile of American Youth study, sponsored by the Department of Defense and the
Military Services, in cooperation with the Department of Labor, is documented in this report.
The principal objectives of the research project were to assess the vocational aptitudes of a
nationally representative sample of youth and to develop current national norms for the
Department of Defense enlistment test, the Armed Services Vocational Aptitude Battery
(ASVAB). The results of this study will also be useful in addressing the issue of the
compatibility between complex and demanding military weapon systems and personnel
capabilities.

For the past four decades, the aptitude levels of military recruits have been referenced
statistically to the extensive testing of adult males that took place during World War II.
Recently, both the Department of Defense and Congress have questioned the
appropriateness of using the World War II "reference population" as a primary basis for
interpreting the enlistment test scores of today's recruits. Thus, it was decided in 1979 that
the vocational aptitudes of current youth should be examined to gain a better understanding
of the quality and representativeness of new enlistees.

An aptitude profile of current youth will provide a basis for evaluating recruiting results. In
addition, if a national emergency necessitates the reintroduction of conscription, military
policy makers must be able to establish entrance standards and induction quotas that are
compatible with manpower resources. To plan for possible mobilization, the Department of
Defense must be able to relate attributes, abilities, and other characteristics of the national
youth population requirements for military manpower.

METHODOLOGY

The Department of Defense contracted with the National opinion Research Center (NORC) of
the University of Chicago to administer the ASVAB during July through October 1980 to a
nationally representative sample of nearly 12,000 young men and women. The sample was
already under study in the National Longitudinal Survey (NLS) of Youth Labor Force Behavior,
sponsored by the Departments of Labor and Defense.

The young people tested were representative of all youth in the United States, ages 16 to
23. The sample contained approximately equal proportions of males and females, including
individuals from urban and rural areas, and from all major census regions. The analyses
conducted in the profile study focused upon young people who were 18 through 23 years of
age at the time of testing.

The test used to obtain aptitude data on the national youth population was the ASVAB. The
ASVAB is used by the Military Services to determine eligibility for enlistment and
qualification for assignment to specific military jobs. Four ASVAB subtests are combined to
form the Armed Forces Qualification Test (AFQT), a general measure of trainability and the
primary criterion of enlistment eligibility.

The AFQT was used as an index for comparing the test performance of civilian and military groups. The analyses reported here include comparisons of the 1980 youth population with the World War II reference population and with military accessions, as well as comparisons of subgroups within the youth population on the basis of age, sex, race/ethnicity, level of education, socioeconomic status, and geographic region.

RESULTS

A comparison of the AFQT category distributions of the 1980 male youth population and the World War II reference population indicated that 40 percent of the 1980 group were in Categories I and II (the above-average categories), compared with 36 percent of the reference population. The proportion in the average range (AFQT Category III was higher for the World War II group than for the 1980 population of male youth. There was no appreciable difference between the proportions of contemporary male youth and the reference population who scored in the below-average range (AFQT) Categories IV and V). The median AFQT percentile score for 1980 male youth (18 through 23 years) was 53, compared with 50 for the World War II population of adult males. Comparison of Military Accessions with the 1980 Youth Population

AFQT scores of the 1980 youth population were compared with those of FY 1981 DoD accessions of the same ages. In general, FY 1981 military recruits scored higher on the AFQT than did contemporary youth. Approximately the same proportions of individuals with above-average scores were found in the 1980 youth population and among accessions. However, the proportion of accessions scoring in the average range was considerably higher than the comparable proportion of youth in the general population. In FY 1981, 80 percent of nonprior service accessions received scores in AFQT Categories I-III, compared with 69 percent of the 1980 youth population. The median AFQT score for all FY 1981 recruits was 52, and the median for 1980 profile youth was 51.

The proportion of FY 1981 Army accessions in the above-average AFQT categories was 14 percentage points below the comparable proportion in the 1980 youth population. Approximately the same proportion of Army accessions and contemporary youth scored in the below-average categories. The median AFQT score for FY 1981 nonprior service accessions in the Army was 41.

Comparison of AFQT scores of the 1980 youth population with FY 1981 nonprior service accessions, by selected demographic characteristics, showed variations in the representativeness of the sexes and racial/ethnic groups. In general, FY 1981 accessions of both sexes scored higher on the AFQT than did their counterparts in the profile study population. FY 1981 minority youth in the general population.

A comparison of the educational distributions of FY 1981 military accessions with the 1980 profile population showed that a greater proportion of the military recruits than civilian youth were high school graduates. Approximately equal proportions of white recruits and white youth in the 1980 profile population had graduated from high school. Black and Hispanic recruits had a much higher proportion of high school graduates that comparable minority subgroups in the general population.

1980 YOUTH POPULATION SUBGROUP ANALYSES

The average (mean) AFQT percentile scores of the 1980 youth population increased with age. Estimates of reading grade level also increased with age.

The average AFQT percentile scores of males and females were similar. Average test scores on the aptitude composites differed. Males scored higher than females on the Mechanical, General, and Electronics composites; females outscored males on the Administrative composite.

The average AFQT score for whites was considerably higher than those of either Hispanics or blacks. This pattern of racial/ethnic group performance was the same on estimates of reading grade level and, for similar sexes, on the four Service aptitude composites.

AFQT percentile scores showed a clear relationship to levels of educational attainment. Non-high school graduates had the lowest average scores, and high school graduates had the highest scores. GED recipients scored between these two groups.

Average AFQT percentile scores were highest for youth in the new England and West North Central regions of the country, and lowest in the three southern regions. Youth in the East North Central, Middle Atlantic, Mountain, Pacific, and West South Central regions scored at approximately the level of the overall population median. (Author)

STUDY IDENTIFIER: AS82005
Wagner, M. P., Dirmeyer, R. P., Means, B., & Davidson, M. K. (1982). Analysis of aptitude, training, and job performance measures (Contract# MDA-903-80-C-0440). Washington, DC: Office of Assistant Secretary of Defense.

This study relates AFQT and Aptitude Composite scores to measures of performance in training and on the job. The utility of current performance measures is evaluated. Alternate measures, which are available but not currently utilized, are identified and assessed. In addition, experimental performance measures were developed and tried out to determine their potential as performance measures. The relationship between experimental measures and AFQT/ASVAB was then determined. Finally, recommendations are made: 1) regarding the use and/or improvement of current training and job performance measures; and 2) concerning the potential of alternate experimental performance measures as criteria against which AFQT/ASVAB can be validated. (Author)

STUDY IDENTIFIER: AS83001
Office of the Assistant Secretary of Defense. (1983). A report to the House Committee on Appropriations: Second annual report to the Congress on Joint-Service effort to link standards for enlistment to on-the-job performance. Washington, DC: Department of Defense. Author.

In July 1980, the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) directed the Military Services to establish a research program to link enlistment standards to job performance. During hearings for the Fiscal Year 1983 (FY83) budget, the House Committee on Appropriations tasked the Office of the Secretary of Defense (OSD) to provide

direct oversight for Joint Service research activities addressing job performance measurement and the eventual linkage of job performance data to enlistment standards. The Committee also requested OSD and the Services to document research progress in an annual report to the House and Senate Committees on Armed Services and Appropriations beginning in December 1982.

This report responds to that Congressional request. Its purposes are to provide a brief review of the Project's background and describe the Joint-Service research strategy for developing job performance measures and subsequent testing of the feasibility of linking enlistment standards directly to job performance information. Chapter One outlines the historical events leading to the Joint-Service Project. Overall Joint research requirements are discussed in Chapter Two as well as each Service's responsibilities for unique portion of these requirements. Chapters Three through Six present each Service's relevant research programs and results achieved during Calendar Year 1983 (CY83). Finally, a brief summary of near-term research and management efforts planned by OSD and the Services is provided in Chapter Seven. (Author)

STUDY IDENTIFIER: AS83002
Office of the Secretary of Defense. (1983). Predicting enlisted military performance (Technical Memorandum 83-1). Washington, DC: Department of Defense.

This technical memorandum presents the proceedings from a symposium with 5 papers on the prediction of enlisted performance. Presenters were Dr. W. S. Sellman; Dr. B. K. Waters; Janice H. Laurence; Barbara Means; and Linda S. Perelman. Dr. Jay Uhlaner was a discussant for the symposium.

The collection of papers discuss various predictors of enlisted performance--from ASVAB/AFQT aptitude measures, to interest measures such as the Educational-Biographical Information Survey (EBIS) developed by HumRRO (Perelman); Moral "Standards" as predictors (Means); and attainment of a high school diploma as a predictor (Laurence); and descriptions of the military selection process (Sellman and Waters).

These papers generally point out that the measures of cognitive aptitude such as ASVAB, combined with high school graduation information predict first term attrition fairly well, but may not show as strong a relationship to later attrition or job performance. More criterion development work is needed before the development of better predictor sets for the prediction of job performance. (Contractor)

STUDY IDENTIFIER: AS84001
Eitelberg, M. J., Laurence, J. H., Waters, B. K., & Perelman, L. S. (1984). Screening for service: Aptitude and education criteria for military entry. Arlington, VA: Human Resources Research Organization.

This report describes the results of a research effort to evaluate the cross-sectional character of military enlistees based on a nationally administered measure of vocational aptitude, the Armed Services Vocational Aptitude Battery (ASVAB). The research was conducted in an effort to provide military manpower decision makers with the most accurate information available on the qualifications (primarily aptitude) of American Youth for entry into the U.S. Military.

48

Data from the Profile of American Youth Study were analyzed by applying recent (1982) military service aptitude and educational standards to the data from the "Profile" study. Framework for this effort was laid by discussing the history and background behind the establishment of Services' enlistment standards.

The study results contain a wealth of data on the aptitude and education qualification rates by ethnic group membership, geographical region of the country, educational attainment and gender.

The study demonstrates the practical utility of the Profile of American Youth data for defining the current manpower pool of qualified American Youth for entry into the Armed Services. It also provides accurate information for personnel decision makers to use in setting future aptitude and Educational Standards. (Contractor)

STUDY IDENTIFIER: AS84002
Department of Defense. (1984). Technical supplement to the Counselor's Manual for ASVAB 14. North Chicago, IL: Military Entrance Processing Command.

The technical supplement provides technical information for high school counselors and other professionals interested in the technical characteristics of the ASVAB as it is used in the DoD student testing program. (Contractor)

STUDY IDENTIFIER: AS84003
Office of the Assistant Secretary of Defense. (1984). Third annual report to the House Committee on Appropriations: Joint-Service efforts to link enlistment standards to job performance. Washington, DC: Office of the Assistant Secretary of Defense, Manpower, Installations and Logistics.

This is the third annual report since the House and Senate Committees on the Armed Services tasked the Department of Defense with direct oversight for joint-Service research activities addressing job performance measurement and eventual linkage to enlistment standards. This report builds on the first two reports which focused on an overall framework for the DoD Effort. This report: (1) reports on the progress in implementing the research previously outlined; (2) details the major research issues and accomplishments of the past year; (3) gives specifics of each of the Services efforts to develop performance measures; and (4) reports findings from the National Academy of Sciences review of the overall Project. (Contractor)

STUDY IDENTIFIER: AS84008
Bock, R. D., & Moore, E. G. (1984). Profile of American Youth: Demographic Influences in ASVAB Test Performance. Washington, DC: Office of the Assistant Secretary of Defense, Manpower, Installations and Logistics.

In 1980 under the auspices of the Department of Defense, the National Opinion Research Center of the University of Chicago administered the Department of Defense enlistment test- the Armed Services Vocational Aptitude Battery (ASVAB)--to a national probability sample of approximately 12,000 young men and women between the ages of 16 and 23. The ASVAB was administered to this sample in order obtain up-to-date national percentile norms for the

for the tests and to provide data for an assessment of the vocational preparation of the contemporary youth population. Because the subjects used in this study had previously been interviewed as part of the Department of Labor's National Longitudinal Survey of Youth Labor Force Behavior, considerable background information, in addition to the ASVAB aptitude information, was available on each subject.

The effects of selected background factors on the ASVAB were examined by computing scaled estimates of ability for each subject in the study and subjecting these scores to multivartiate analysis of variance based on the background classification. The analysis of variance indicated that average scores on some or all of the ASVAB tests were related to the background factors--including sex, highest grade completed, sociocultural group (White, Black, Hispanic), economic status (above or below the OMB-defined poverty line), region of residence at age 14, and mother's highest grade completed.

The sociocultural groups differed in ASVAB test performance according to years of education, economic status and type of ASVAB subtest. The interpretation of the observed differences in the test performance of Whites, Blacks and Hispanics must be qualified with respect to the educational, economic, and vocational context in which they appear.

This study found that the educational effects are strongest for tests that measure school-intensive knowledge and skills such as Arithmetic Reasoning, Mathematics Knowledge, Electronics Information and, to a lesser extent, General Science and Mechanical Comprehension. In topics that must be learned primarily in school, the White and nonpoor groups have an advantage over minority groups and over the poor. Such groups presumably are less likely to have had the benefit of attending schools that have better instructional resources and maintain higher standards. This advantage is much less apparent in topics that are less tied to schooling and more a part of daily experience in and out of school, such as Word Knowledge, Paragraph Comprehension, Numerical Operations and Coding Speed. In these more basic competencies, the differences in scores between the sociocultural groups are essentially constant at all education levels. The results discussed in Chapter 5 suggest that access to higher quality education has relatively less effect on the general types of skills.

The English language limitations of Hispanics were not very apparent in the Profile data. For the nonlanguage tests in the battery--Numerical Operations and Coding Speed--Hispanics and Whites were very similar in performance, and the largest differences were not in the language tests--Word Knowledge and Paragraph Comprehension--as might be expected, but in the specialized knowledge tests and Arithmetic Reasoning. The study results indicate that differences between Hispanics and Whites may be due more to differential educational emphasis than differential English-language competence.

Some of the test scores reflected prevailing practices in mathematics teaching in American schools. In the tests where formal mathematics instruction plays a prominent role (Arithmetic Reasoning, Mathematical Knowledge and Numerical Operations, in lower education levels) there was a reduced difference between scores of persons who had some high school education compared to those who had completed high school. This was interpreted to be the result of many high school students' having ended their formal mathematical training at the first and second year of high school, so that less gain is seen in these tests between groups that have completed high school and those that have not. Those students who are college bound are more likely to continue their mathematics training into the third and fourth years of high school and, therefore, show relatively higher performance on these types of tests both before matriculation and subsequently as they take additional mathematics courses in the early years of college.

There were small but readily interpretable regional differences in ASVAB test performance. The regional effect on the test scores was small, seldom more than 20 scale points, but was statistically significant. The patterns of regional attainment for Blacks and Whites were similar. Both Blacks and Whites in the Northeast performed slightly better than their counterparts elsewhere in the country. The performance of Blacks and Whites of either economic status was highest in the Northeast, lowest in the Southeast with the Midwest and West falling in the middle range. The Northeast showed higher scores especially in the more academic subjects such as General Science, Arithmetic Reasoning and Mathematics Knowledge, perhaps reflecting higher scholastic standards in these academic areas in that region of the country. The West was especially strong both in Auto and Shop Information and in Mechanical Comprehension, suggesting greater emphasis on practical skills. The Southeast region, both for Whites and Blacks, generally showed the lowest level of performance, although for Blacks the difference between the Southeast and West is small.

While Blacks generally performed better in the Northeast and Midwest than in the Southeast and the West, Hispanics showed a converse pattern. The highest levels of performance were in the Southeast and Midwest with both the East and West showing generally lower levels. The nonpoor Hispanics of the Southeast and Midwest performed at about the same level as the nonpoor Whites in Paragraph Comprehension, Numerical Operations and Coding Speed. In General Science, Arithmetic Reasoning and Word Knowledge Hispanics of the Southeast performed almost at the same level as the nonpoor Whites. Some of the largest differences between the nonpoor and poor groups occurred among the Hispanics especially those of the Midwest, suggesting that economic factors are more dominant for Hispanics than for either Whites or Blacks. All in all, the regional and socioeconomic effects, especially the regional effects among Hispanics, tended to demonstrate the impact of the cultural background on performance on these types of vocational tests.

This study rejects the theory that differences in the average test performance of the sociocultural groups are of genetic origin, and instead espouses a community norm theory as the best explanation of the sociocultural group differences. That is that the communities represented by the present more-or-less exclusive sociocultural subpopulations in the United States maintain, for historical reasons, different norms, standards and expectations concerning performance within the family, in school and in other institutions that shape children's behavior. Although the task of raising standards of test performance is traditionally assigned in the abstract to schools, schools in the United States are responsible first to their communities, only secondarily to states and only indirectly to the nation. Thus, norms of the immediate community tend to be perpetuated, even when the result is the range of group differences such as that seen in the Profile study. The process of raising standards involves the whole of the communities that these schools serve and must extend to parents, families, social groups, and every institution in which members of the community participate. Moreover, the community norm is part of the cultural transmission from one generation to another, and the process must work on the scale of decades, not just years. Only steady and consistent efforts over an extended period can produce significant changes in the community norm and in the educational standards it represents.

Another influence on test performance is mother's education and years of formal schooling. This within-family influence has only a weak interaction with any of the other background factors. Mother's education has a strong and direct association with test performance, especially in those tests which depend upon language and instruction (Word Knowledge, Paragraph Comprehension, General Science, Arithmetic Reasoning, and Mathematics Knowledge). The mother's educational variable is of interest primarily in the extent to which it shows how family background characteristics are reflected in test performance. In large-scale studies where a wide range of education levels is represented, mother's education is an effective indicator of the family's contribution to children's intellectual attainment.

51

Among persons of different ages who had the same number of years of education, some test scores increased with age, some declined, but for the most part levels of performance remained about what they were at the end of formal education. Performance on tests representing intensive school learned skills--Arithmetic Reasoning and Numerical Operations- tended to decline after a person completes formal schooling. Performance on test content that is learned mostly by experience, such as Auto and Shop Information and Electronics Information, tended to improve after leaving school. The general tendency was, however, for the level of performance on all tests to remain near their former levels at the end of schooling. This analysis confirmed the impact of formal school completion in channeling the vocational opportunities for American youth.

This study found that the magnitude of sex related differences varied strongly with the type of test. Men and women differed most in knowledge of topics that are traditionally specialized by sex, but the effect was more apparent in Whites and Hispanics than Blacks. Typical of the sex differences where average scores of men exceeded those of women was performance on the Auto and Shop Information test. Among nonpoor Whites and Hispanics, the average scores of male subjects exceeded those of female subjects by slightly more than 100 scale points. This pattern of attainment suggested that with greater access to automobile and shop experience, it is the young men who benefit most. By circumstance or choice, women did not, at the time of this study, participate in study or activities that brought them into contact with this kind of information. Among Blacks, poor Whites and Hispanics, auto and shop information was presumably less available or less exploited by both males and females and as a result the sex differences were smaller.

This study found that where men seem to have the advantage for quantitative and technical tasks, patterns of female advantage are seen in fluency tasks, as are tested by Coding Speed, Numerical Operations, and Paragraph Comprehension. This study confirmed that women excelled in reading comprehension and in tasks requiring fast and accurate responses. This study suggested that there may be physiological differences between the sexes to account for the differences in scores on the tests requiring spatial ability and quantitative and configural problem solving--Arithmetic Reasoning and Mechanical Comprehension tests.

Some sex differences in test performance increased with education while other decreased. The study found that for Auto and Shop Information, Mechanical Comprehension, Electronics Information General Science, and Arithmetic Reasoning the differences between the sexes increased with increasing education. The study interpreted this as an example of the principle seen in the interaction of sex differences with sociocultural group and economic status, that is in areas where there is greater opportunity for exposure and experience in those areas where males generally perform better that females, males benefit more from such exposure and so increase the disparity of performance between the sexes. The study also asserted that with the increasing specialization that comes with education, men and women also become more specialized in sex-typed knowledge and skills that lead to different profiles of average vocational test scores. At lower educational levels, experience and instruction are more common between the sexes and sex differences in test performance are not as large.

Not surprisingly, differences in the vocational test performance of men and women affected their vocational opportunities. The implications of these patterns of sex differences of vocational choice are well known and widely discussed. This study provides a more complete account of these vocationally relevant sex differences than has previously been available.

Overall, the differences in test performance of young people at the same level of education in different social and economic groups show the need for more comprehensive standards of educational attainment. This study reveals striking disparities between sociocultural and economic groups on all tests. This study advocates the diffusion of high achievement standards to all sociocultural groups and concludes with the assertion that if the high standards which presently exist for some are diffused to all, society will benefit from future generations that have broader potential for productive and creative lives than any that have gone before. (Contractor)

STUDY IDENTIFIER: AS84009
Department of Defense. (1984). Armed Services Vocational Aptitude Battery (ASVAB) test manual for ASVAB Forms 8, 9, 10, 11, 12, 13, and 14 (DoD 1304, 12AA). North Chicago, IL: United States Military Entrance Processing Command.

This test manual documents the procedures used in the development of the Armed Services Vocational Aptitude Battery (ASVAB), and reports evidence of its technical merit, the extent of its compliance with ethical principles for the development, validation, and use for personnel selection procedures. It is written for technical personnel in the test development and analysis field.

The document is based upon technical publications of the personnel research activities of the Army, Navy, Marine Corps, and Air Force, and upon formal and informal memoranda from the Department of Defense offices involved in policy oversight of the Armed Services enlistment testing programs. Given the magnitude of the supporting research for the enlistment testing system, not all research was cited in this document. In general, the document covers the development of ASVAB Forms 8, 9, and 10; The calibration and score-scale equating of Forms 8, 9, and 10 in the World War II (or 1944) metric; ASVAB reliability and validity; Administrative procedures; and compliance with APA test standards. (Contractor)

STUDY IDENTIFIER: AS85002
Grissmer, D. W., & Kirby, S. N. (1985). Attrition of nonprior-service reservists in the Army National Guard and Army Reserve (R-3267-RA, AD-A161 639). Santa Monica, CA: The Rand Corporation.

The Army Reserve and Army National Guard annually enlist approximately 70,000 individuals who have had no prior military experience. These enlistees receive full-time training to qualify them for a military occupational specialty (MOS). Their training, which is the same as that given to U.S. Army enlistees, varies in length from four months to over one year, depending on the MOS.

The marginal cost of the training, including military pay during the training period, can vary from $4000 to over $20,000 per individual. The return from this training investment to the reserve components comes as the individual serves the full term of enlistment, usually six years. The high rate of separation prior to the completion of the six-year term substantially reduces this return. Estimates from our projections based on the FY1980 cohort show that approximately six in ten Army guardsmen and three in four Army reservists will separate before completing the full term.

These high separation rates increase both accession and training costs significantly by raising the number of accessions required to maintain a given reserve force size. This problem may become critical in coming years, when the decline in the 17- to 21-year-old population pool will make recruiting more difficult and more expensive. Thus, reducing attrition may be the key to achieving the scheduled growth in the Army reserve components over the next several years. Increased strength levels will be much more easily maintained if ways can be found to keep first-term reservists until the end of their term.

This study analyzes attrition of the FY1980 nonprior-service enlistment cohort of Army guardsmen and Army reservists during the first two years of their enlistment. The separation rate during this period was 30.6 percent for the National Guard and 39.5 percent for the Army Reserve. We hypothesized three causes for these levels of reserve separation: the quality and demographic composition of the enlistment cohort; transfers to the active force or to a reserve component (including returns to the same component); and the difficulty, for young people, of holding a moonlighting or extra job during a time when they are entering the full-time labor force, building a career, marrying, and starting a family.

The data for the analysis were developed at the Defense manpower Data Center (DMDC) from the Reserve Components Common Personnel Data System (RCCPDS) by merging enlistment records, quarterly personnel records, and separation records for each enlistee in the FY1980 cohort. In addition, for each separation record a search was made through later active and reserve force files to determine whether the individual had enlisted in the active force or in another reserve component or returned to the same component within the two-year period.

Statistical models of separation were estimated using a logit functional form to analyze the determinants of the separation decision. These models can be used to estimate the probability of attrition for an individual with any combination of characteristics.

The models were estimated for three time periods: separation during training, separation after training but before the end of the two-year period, and separation during the entire two-year period. For each period, we used two definitions of attrition. The first includes individuals who separate to civilian life and do not return to the military; the second includes those who separate to civilian life and those who separate to the active force or to a reserve component (including return to the same component).

These definitions reflect two disparate viewpoints. From the point of view of the total force, attrition to civilian life is the central problem since some recoupment of training investment is obtained if an individual stays within the total force. From the viewpoint of the individual component, however, separation from the component--regardless of the destination--is the critical variable, since turnover lowers readiness and raises component manpower costs.

The results show that separation rates for both components, like those for the active force, are sensitive to the education level, aptitude scores, and demographic composition of the enlistment cohort. Other things equal, women have significantly higher attrition rates than men, high school nongraduates have significantly higher separation rates than high school graduates, and those with higher aptitude scores have lower attrition rates. Race proved to affect attrition less than the first enlistees. Marital status and age have a much smaller effect but also tend to have different patterns for men and women enlistees.

If only separations to civilian life are examined, the Guard and Reserve have somewhat similar levels of attrition. The Reserve loses 28 percent to civilian life; the Guard, 25 percent. The results also show that many reservists separate to enter an active or another reserve component, or to return later to the same component. This category of separation

constitutes 28 percent of Army Reserve separations and 17 percent of Army National Guard separations during the first two years. Among those separating who later return to an active or reserve component, 70 percent to 75 percent enter the active force; the remainder return to a selected reserve component. An analysis of the quality of the three types of separations shows that those going to the active force are the highest quality and those returning to civilian life are the lowest quality.

Reservists typically tend to be 17 to 25 years old. Reserve attrition patterns may thus be shaped by the many competing demands on reservists at this stage of their lives. These demands typically involve entry into the full-time labor force, building a career, marrying and starting a family, and perhaps further education. Such transitions may include frequent changes of full-time job, several moves of residence, and increasing family responsibility. Family and employer conflicts, shown to be the leading causes of separation at the reenlistment point, probably also operate during the first enlistment term.

Geographic moves away from the local reserve unit often cause separation from reserve service. Linkup with a new unit may be uncertain because of skill mismatches or lack of vacancies. Our results are consistent with the hypothesis that groups with greater geographic mobility and earlier marriage are more likely to separate. In particular, the higher separation rates of women may result from earlier marriage and more frequent geographic moves. Additional analysis linking survey data could further test these hypotheses.

The timing of attrition differed markedly in the Army national Guard and Army Reserve. For the Guard, 70 percent of civilian attrition occurred during training; for the Reserve, only 28 percent occurred during training. The statistical pattern suggests that lower levels of training attrition lead to higher levels of post-training attrition. It suggests also that individuals who survived Guard training were more highly selected and thus less likely to leave after training. For Reserve, the pattern appears to be the opposite. These patterns may reflect the different screening procedures used for combat-oriented skills in the Guard in contrast to combat-support skills in the Reserve. They may also result from different training policies in the two components.

The results point to a number of areas requiring further research before policy initiatives are undertaken. These areas include more intensive use of survey data for gathering information on attrition. Reserve attrition files could be linked to existing reserve survey files and longitudinal civilian data files. Simultaneous analysis of several recent cohorts would help researchers to understand the effect of training and personnel policies on attrition. Finally, the attrition of prior-service enlistees could be analyzed and the results combined with enlistment supply models for both nonprior- and prior-service enlistees in order to determine substitution possibilities between the two types of enlistees. (Author)

STUDY IDENTIFIER: AS85003
Office of the Assistant Secretary of Defense. (1985). A report to the House Committee on appropriations: Fourth annual report to Congress on Joint-Service efforts to link enlistment standards to job performance. Washington, DC: Department of Defense. Author.

This fourth annual report builds on the first three which focused on the strategy, structure, and implementation of the DoD effort. The first report (December 1982) outlined the actions taken to establish formal Office of the Secretary of Defense oversight of the Joint-Service Project. The second report (December 1983) described the Joint-Service research strategy for developing job performance measures and testing the feasibility of linking enlistment standards to job performance data. The third report (December 1984) described the

progress in implementing the overall research strategy as well as the Service-by-Service progress in developing job performance measures. This report: 1) details the progress in implementing the overall research strategy described in the earlier reports, 2) highlights the significant issues, events, and accomplishments during calendar year (CY) 1985, 3) reviews the Service-by-Service progress in developing job performance measures, and 4) outlines Service plans for the institutionalization of job performance measurement technology beyond the research phase.

Specifically, the contents of this report are as follows: Chapter One summarizes the Project's history and working relationships with oversight groups. Chapter Two outlines the Project's research and development strategy. Chapter Three describes several significant events and accomplishments of the Joint-Service effort during CY 1985. Chapters Four through Seven report individual Service progress. (Author)

STUDY IDENTIFIER: AS86002
Office of the Assistant Secretary of Defense. (1986). A report to the House Committee on appropriations: Fifth annual report to Congress on Joint-Service efforts to link enlistment standards to job performance. Washington, DC: Department of Defense.

This fifth annual report builds on the first four which focused on the strategy, structure, and implementation of the DoD effort. The first report (December 1982) outlined the actions taken to establish formal Office of the Secretary of Defense oversight of the Joint-Service Project. The second report (December 1983) described the Joint-Service research strategy for developing job performance measures and testing the feasibility of linking enlistment standards to job performance data. The third and fourth reports (December 1984 and December 1985) described the Services' progress in implementing the overall research strategy. This report: 1) highlights the significant issues, events, and accomplishments during calendar year (CY) 1986, 2) reviews the Service-by-Service progress in developing and implementing job performance measures, and 3) outlines the National Academy of Sciences' Committee on the Performance of Military Personnel's recommendations and evaluation of the Joint-Service Project.

Specifically, the contents of this report are as follows: Chapter One summarizes the Project's history and working relationships with oversight groups. Chapter Two outlines the Project's research and development strategy. Chapter Three describes significant events and accomplishments of the Joint-Service effort during CY 1986. Chapter Four contains the National Academy of Sciences' recommendations for the Joint-Service Project. Chapters Five through Eight report individual Service progress. (Author)

STUDY IDENTIFIER: AS87001
Office of the Assistant Secretary of Defense. (1987). A report to the House Committee on appropriations: Sixth annual report to Congress on Joint-Service efforts to link enlistment standards to job performance. Washington, DC: Department of Defense, Force Management and Personnel.

This sixth annual report highlights the status and accomplishments of the congressionally directed Joint-Service Project to link military enlistment standards to on-the-job performance.

PROJECT'S GENESIS AND MANDATE

The Joint-Service Job Performance Measurement/Enlistment standards Project began in July 1980, when the Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) directed the Military Services to establish a research and development program to link enlistment standards to job performance. During the Fiscal Year 1983 Budget hearings, the House Committee on Appropriations tasked the Office of the Secretary of Defense to provide direct oversight for Joint-Service research activities addressing job performance measurement and the eventual linkage of job performance data to enlistment standards. Furthermore, the Committee requested an annual report to the House and Senate Committees on Armed Services and Appropriations, documenting research progress. These reports began in December 1982.

PROJECT'S VALUE

Determining manpower quality requirements with any measure of precision is not currently possible. Such an effort would require a validated cost trade-off model that would permit the evaluation of the relative costs and benefits of different force quality levels. A principal problem in developing a validated cost trade-off model is the difficulty in measuring on-the-job performance. The basic instrument used by the Services to select enlisted personnel is a paper-and-pencil test called the Armed Services Vocational Aptitude Battery (ASVAB). Traditionally, the ASVAB has been validated against training success. The Joint-Service Project is developing prototype job performance tests in selected jobs in each of the Services; cumulatively, most types of military specialties will be represented. Once reliable job performance measures are available, the Joint-Service Project will examine the relationship of job performance measures to the ASVAB. The ultimate goal will be to validate enlistment standards against actual job performance, instead of success in training. If this research enables us to establish a definitive link between enlistment criteria and job performance, we will then be able to determine accession quality requirements with greater precision than is now possible.

The success of this Project largely depends on the full cooperation and support (in principle and financially) from the Congress. Delays or reductions in funding will retard the effort and dissipate the Project's momentum. Because of the importance of the manpower quality issue, both the Congress and the Department of Defense must ensure that the momentum of the Joint-Service Project is maintained. (Author)

STUDY IDENTIFIER: AS88001

Laurence, J. H. (1988). *Job complexity and military performance: A comparison of high and average aptitude recruits* (HumRRO FR-PRD-88-12). Alexandria, VA: Human Resources Research Organization.

For FY 1979 through 1982 accessions, the relationship between aptitude level and military performance within jobs of varyi..g cognitive complexity was examined. Results indicated that high aptitude recruits outperformed their average aptitude counterparts in jobs of all difficulty levels. In high, medium, and low complexity military occupations alike, above average recruits tended to have lower attrition rates and higher promotion rates. Furthermore, performance varied with job complexity in the same manner for all aptitude groups. Attrition was highest and promotion was lowest in relatively easy jobs. The impact of low complexity jobs on recruits' behavior was less detrimental for high aptitude as compared with average accessions. (Author)

STUDY IDENTIFIER: AS88002
Rosenthal, D. B., & Laurence, J. H. (1988). Job characteristics and military attrition (FR-PRD-88-11). Alexandria, VA: Human Resources Research Organization.

Attrition rates for military jobs were calculated from the Service records of FY 1979 through FY 1983 enlisted personnel. Several job characteristics predicted the attrition rates. The two best predictors were level of mental challenge (i.e., job complexity) and degree of unpleasant working conditions. The job characteristics which predicted attrition for high aptitude recruits were the same characteristics which predicted attrition for average aptitude recruits. A model was presented showing how job characteristics relate to attrition. It was argued that job characteristics should not be conceptualized as a "direct cause" of attrition but rather as one part of the psychological process which results in an individual's decision to quit the Service. (Author)

STUDY IDENTIFIER: AS89001
Office of the Assistant Secretary of Defense. (1989). A report to the House Committee on appropriations: Joint-Service efforts to link enlistment standards to job performance: Recruit quality and readiness. Washington, DC: Department of Defense, Force Management and Personnel, Force Management and Personnel.

This seventh annual job performance measurement report builds on the first six which focused on the strategy, structure, and implementation of the DoD effort. The first report (December 1982) outlined the actions taken to establish formal Office of the Secretary of Defense oversight of the Joint-Service Project. The second report (December 1983) described the Joint-Service research strategy for developing job performance measures and testing the feasibility of linking enlistment standards to job performance data. The third, fourth, fifth, and sixth reports (December 1984, December 1985, December 1986, and December 1987) described the Services' progress in implementing the overall research strategy. While this report highlights the data collected to date and reviews the Service-by-Service progress in developing and implementing job performance measures, it also focuses on the relationship between recruit quality and individual performance, and on measures of personnel, unit, and force readiness.

Specifically, the contents of this report are as follows: Chapter One summarizes the project's background, history, and strategy. Chapter Two presents a substantial discussion of the readiness issues and the process of linking recruit quality indicators to force readiness. Chapter Three provides a summary of the Service efforts to date to measure individual job performance, presenting the results of the data analyses common across the Services, while Chapters Four through Seven report individual Service progress. Chapter Eight outlines directions for future research and application. Chapter Nine presents the conclusions and summarizes the report. (Author)

V. UNITED STATES COAST GUARD

STUDY IDENTIFIER: CG81001

Frey, R. L. (1981, October 25-30). <u>Prediction of boot camp attrition: IRT versus number-right scoring</u>. Proceedings of the Annual Conference of the Military Testing Association, Washington, DC.

Item Response Theory (IRT) appears to be the wave of the near future in testing. Although the IRT literature is voluminous, it seems that there are, to date, virtually no data on the improvement in predictive validity from IRT scoring as compared to number-right scoring. The US Coast Guard uses the Coast Guard Selection Test (CGST) for enlistment screening. The CGST is a battery of three tests: verbal ability, arithmetic ability, and mechanical comprehension. A large sample (ca. 2200) of Coast Guard enlistees was tracked through boot camp to obtain the criterion data on completion/attrition. For this sample, number-right scoring and IRT scoring were applied to each of the three subtests of the CGST. Comparisons were made on various indices of predictive validity between the two types of scoring. Implications of the findings for improving military selection procedures were discussed. (Author)

VI. CIVILIAN

STUDY IDENTIFIER: CV69001

Fox, W. L., Taylor, J. E., & Caylor, J. S. (1969). Aptitude level and the acquisition of skills and knowledges in a variety of military training tasks (TR-69-6, AD-688 263). Alexandria, VA: Human Resources Research Organization.

To assess the effects of wide differences in aptitude on the acquisition of military knowledges and skills, a sample of 183 Army recruits was divided into three maximally distant aptitude groups on the basis of their AFQT scores: High aptitude, AFQT 90-99; Middle aptitude, AFQT 45-55, Low aptitude, AFQT 10-21. Each recruit was individually trained to a performance criterion in differing combinations of a battery of eight tasks representative of Army training. A variety of supplementary psychometric, scholastic achievement, and BCT attainment data were analyzed. The results were consistent in demonstrating large differences related to aptitude. As groups, high aptitude individuals excelled, low aptitude individuals did poorly, and middle aptitude groups fell in an intermediate range on all measures. (Author)

STUDY IDENTIFIER: CV71001

Vineberg, R., Sticht, T. G., Taylor, E. N., & Caylor, J. H. (1971). Effects of aptitude (AFQT), job experience, and literacy on job performance: Summary of HumRRO work units utility and REALISTIC (TR-71-1, AD-722 392). Alexandria, VA: Human Resources Research Organization.

A series of studies were conducted to determine how Army personnel in Mental Category IV and in other mental categories compare in their job performance and in their overall suitability for military service. Information is provided concerning the demands for reading, arithmetic, and listening skills in four major military occupational specialties. The performance of approximately 1800 men with Army experience ranging up to 20 years was measured by intensive job sample tests, job knowledge tests, and supervisor ratings. Information about background, personal characteristics, and military experiences was obtained through biographical questionnaires, a battery of published and experimental tests, and Army records. The major findings and conclusions are given in this summary report, which will be followed by several detailed reports on various research phases. (Author)

STUDY IDENTIFIER: CV72001

Vineberg, R., & Taylor, E. N. (1972). Performance in four Army jobs by men at different aptitude (AFQT) levels: Relationship between performance criteria (TR-72-23, AD-750 604). Alexandria, VA: Human Resources Research Organization.

A study was made of approximately 1800 men with experience ranging to 20 years in five different Army MOSs to provide information about the performance and characteristics of effective and ineffective marginal personnel in the Army. The study included a group of men with Armed Forces Qualification Test scores (AFQT) in the marginal range and a comparison group of men in the same jobs, but in the upper range of AFQT scores. Performance was measured by intensive job sample tests, job knowledge tests, and supervisor ratings. Biographical questionnaires, a battery of published and experimental tests, and Army records

provided information about background, personal characteristics, and military experiences. This report, the fourth in a series presenting the extensive data and analyses, examines the determinants of job behavior and describes the relationships among the three performance criteria used in the study: job sample tests, job knowledge tests, and supervisor ratings. (Author)

STUDY IDENTIFIER: CV77001
Weisen, J. P., & Siegel, A. I. (1977). Development and evaluation of a method for approximating ASVAB validity data. (Unpublished report). Wayne, PA: Applied Psychological Services, Inc.

A technique was developed and tested for estimating or approximating the predictive validity of the Armed Services Vocational Aptitude Battery (ASVAB) when actual validation has not been performed. The technique is empirically based and relies on job analytic data and on predictive validity for a pool of jobs. The technique is believed to be general and not specific to any particular job or type of jobs. Application to the Armed Services Vocational Aptitude Battery indicated that for 5 of the 7 currently employed ASVAB subtests considered, the validity approximation technique was moderately accurate. A set of job profiles derived from the validity data was subjected to qualitative evaluation by "experts." With minor exception, the profiles were considered to be in conformity with the "experts'" visualization of the jobs involved. A simple modification of one aspect of the profiles was suggested to eliminate the one source of difficulty. (Author)

STUDY IDENTIFIER: CV80001
McNaught, W. (1980). Performance changes of Military Qualification Tests during the first term of Service (P-6464, AD-A094 945). Santa Monica, CA: The Rand Corporation.

The purpose of this investigation was to examine the hypothesis that Category IV personnel reenlistment rate patterns are higher than the other personnel categories. The question of interest was whether or not CAT IV personnel are still CAT IV's when they reenlist in the All - Volunteer Force.

The Military Personnel Center selected 1125 airmen in their 5th and 6th years of service. All Category IV personnel at 12 base sites were then retested. With regard to Category I-III personnel, only 20% were retested. Once files were merged, the sample consisted of 692 airmen who had enlisted between November 1965 and November 1968.

Old and new score distributions were compared and regression analyses were performed in order to help explain score gains or decreases.

A substantial increase in scores occurred in every category except, naturally, Category I since this is the category with the highest scores. The average gains for Category III and Category IV personnel were 13.1 and 15.5 percentage points respectively.

With regard to the regression analyses, black Category IV airmen did significantly worse than their white counterparts in improving their AFQT scores. This effect was not evident for black Category III subjects. Motivation variables, such as "attending college" or "promotion to E5", were positively correlated with AFQT score gains. Further, personnel assigned to areas requiring more training exhibited positive average gains in AFQT scores than those individuals assigned to areas requiring less training.

The results of this study suggested systematic changes and not test biases. It was also concluded that increases in AFQT scores were due to increases in age and work experience. Thus, achievement and not aptitude was depicted. (Contractor)

STUDY IDENTIFIER: CV80002
Pearlman, K., Schmidt, F. L., & Hunter J. E. (1980). Validity generalization results for tests used to predict job proficiency and training success in clerical occupations. Journal of Applied Psychology, 65, 373-406.

This article presents results of the first large-scale test of Schmidt and Hunter's Bayesian validity generalization procedure. This procedure was applied to 56 distributions of validity coefficients drawn from 698 published and unpublished studies representing five clerical job families, 10 test types, and two classes of criteria--job proficiency and training success. Results showed that most of the between-study variation in empirical validity results was accounted for by four statistical artifacts, thus casting serious doubt on the traditional belief that employment test validities are situationally specific. It was also found that in most cases generalization of validity to similar clerical jobs or new settings was justified, even where the hypothesis of situational specificity could not be rejected with certainty. Further, validity generalization could be supported based on corrections for sampling error alone. The correlation between mean test type validities for proficiency and training criteria was found to be high, indicating that contrary to previous belief, similar ability measures are predictive of both criterion types. Implications of these findings are discussed in terms of both practical applications and theory development in industrial-organizational psychology. (Author)

STUDY IDENTIFIER: CV81002
Diehl, C. E. (1981). An analysis of factor patterns in the Armed Services Vocational Aptitude Battery for high school seniors. Unpublished doctoral dissertation, Auburn University, Auburn, AL..

Armed Services Vocational Aptitude Battery (ASVAB) Form 5 scores from 12 samples of high school seniors (Ns from 76 to 469,851) were factor analyzed using principal components analysis, principal factor analysis, and the Kaiser Little Jiffy technique. A total of 32 factor analyses were conducted.

Overall, about 50 percent of ASVAB variance was contained in two factors. Orthogonal rotation usually extracts a broad based technical/academic factor and a smaller perceptual speed factor. Oblique rotation extracts a technical skill/information factor and a scholastic skill/information factor. (Perceptual speed is usually subsumed within the latter.) The two oblique factors are correlated usually between .60 and .80. Additional factors account for small proportions of variance, have ambiguous factor patterns, and are, therefore, of limited value.

The factors extracted in this research contrast with those determined by the ASVAB test publisher. They should, however, clarify the meaning of ASVAB results to test users (counselors and students) and increase the applicability of ASVAB data to broad curriculum and educational decision-making. The evidence suggests that new interpretive materials reflecting these factors should be prepared. (Author)

STUDY IDENTIFIER: CV82001
Sticht, T. G., Hooke, L. R., & Caylor, J. S. (1982). Literacy, oracy, and vocational aptitude as predictors of attrition and promotion in the armed services (HUMPRO-PP-2-82, AD-A115 083). Alexandria, VA: Human Resources Research Organization.

This research was conducted to (1) produce normative data for the LAB, Literacy Assessment Battery, and (2) evaluate the LAB as a potential supplement to the Armed Services Vocational Aptitude Battery for use as a selection and classification instrument. To determine the distribution of auding and reading skills in the population that applies for military service, Mathews, Valentine, and Sellman (1978) administered the LAB test to over 4500 applicants for service as a part of research to study reading skills of applicants for military service. Understanding the nature of literacy and the relationships of literacy to aptitude assessment can lead to improvements in selection and classification. (Author)

STUDY IDENTIFIER: CV84001
Hunter, J. E. (1984). The validity of the ASVAB as a predictor of civilian job performance. (Unpublished Report). Rockville, MD: Research Applications Inc.

This investigation focused on the validity of the ASVAB. The first section of the report reviewed the evidence from the civilian sector which indicated that general cognitive ability predicts performance in all jobs. The second section discussed the evidence which showed that the ASVAB contains subtests measuring similar aptitudes used in cognitive ability composites found in the civilian sector. The third section of this report presented evidence from military validation data which indicated the relationships between certain ASVAB subtests and three aptitudes measuring quantitative, verbal and technical abilities.

This study made use of 3 methodologies to demonstrate the generalizability of ASVAB validity. The first quantitative method involved the synthesizing of validity coefficients across studies using meta-analysis and validity generalization techniques. The second quantitative method demonstrated construct validity of ASVAB subtests using reliability theory and confirmatory factor analysis. The third method of path analysis helped in determining the direct and indirect relationships between aptitudes and performance.

Convincing evidence for the validity of the ASVAB subtest was established. This research effort provided a data base which demonstrated that the ASVAB test battery measures cognitive ability better than most comparable civilian batteries. As a result of this study the ASVAB validity coefficient appeared to be higher than validity coefficients for civilian tests.

Certain ASVAB subtests, which are similar to subtests used by the civilian sector, measure similar cognitive abilities. The ASVAB can then duplicate cognitive composite scores used to measure cognitive ability in civilian studies. Thus, the validity coefficient in civilian studies establishes the minimum validity coefficient level of the ASVAB in predicting success in civilian occupations. (Contractor)

STUDY IDENTIFIER: CV84002
Fernandez, R. L., & Garfinkle, J. B. (1984). Setting enlistment standards and matching recruits to jobs using job performance criteria (R-3067-MIL). Santa Monica, CA: The Rand Corporation.

This study attempts to provide an objective basis for selecting and classifying non-prior service recruits. The report attempts to go beyond the usual use of aptitude and educational data to make the traditional decisions in the extant selection and classification process by combining the educational/aptitude data in a cost/performance trade-off model developed for this effort.

Using four Army jobs, the authors measured job performance in two ways: 1) the tendency to reenlist after the first term and 2) performance on the Skill Qualification Test (SQT). These measures were combined to produce a single criterion measure termed a Qualified Man Month (QMM). The study then examined the trade-off between the cost of recruiting at various aptitude and education levels to produce given levels of QMM.

The model was used to examine the effect of differing entry-level standards on both the cost of recruiting and optimal choice of entry level standards.

Results showed that use of the performance data and model permitted only small improvements over what the Army was able to achieve.

The study raised a number of questions for future research that will need answers to help military manpower planners in the future. (Contractor)

STUDY IDENTIFIER: CV84003
Means, B., & Laurence, J. H. (1984). Characteristics and performance of recruits enlisted with general education development (GED) credentials (FR-PRD-84-6, AD-A143 035). Alexandria, VA: Human Resources Research Organization.

Between FYs 1977 and 1982, General Educational Development (GED) credential holders comprised five percent of males and seven percent of females entering a first term of military service. For enlistment purposes, GED holders generally are preferred to those without any secondary education credential but are less preferred than holders of regular diplomas. The proportion of new recruits who hold GED credential tends to fluctuate with the recruiting market, with higher percentages of GED holders accepted when fewer high school diploma graduates are available.

Compared to diploma graduate accessions, recruits who hold GED credentials are more likely to be male, white, over 20 years of age upon service entry, and to have Armed Forces Qualifying Test (AFQT) percentile scores of 50 or above.

GED holders consistently perform less well than diploma graduates in terms of military suitability indices such as attrition rates or retention beyond an initial term. The large difference between GED holders and diploma graduates in terms of attrition are not mitigated by aptitude or service occupational specialty group. Within any given AFQT category, the 36-month attrition rate for GED holders is at least 20 percent higher than that for diploma graduates. Within any of the eight DoD occupational specialty groupings, the attrition rate for GED holders is considerably higher than that for diploma graduates. In fact, for 29 of the 32 Service-occupation group combinations, the GED 36-month attrition rate is more than double that of high school graduates. Age is more strongly related to attrition rate for GED

holders than for other education groups. Older GED holders have lower attrition rates than GED holders who were younger at the time of service entry. Nevertheless, even among older accessions, GED holders experience adverse attrition rates between 10 and 11 percent higher than those of high school graduates of the same age. (Author)

STUDY IDENTIFIER: CV84004
Buddin, R. (1984). Analysis of early military attrition behavior (R-3069-MIL). Santa Monica, CA: The Rand Corporation.

In this study, a multivariate model is created to explain the early attrition process; it is designed to assess the contribution of demographic background, prior experience, job match and satisfaction, entry point decisions, alternatives to the military, and socioeconomic factors to early attrition of enlisted males. The framework was based on recent firm-specific human capital and job matching models that analyze the dynamics of job separation. Comparisons are drawn between the determinants of early military attrition and civilian job separations of young workers, and the effects of various factors are also compared across services. Finally, this research relates the analysis of early attrition to previous research on post-training attrition and attrition over the entire first term.

The analysis is based on a matched file containing the 1979 Survey of Personnel Entering Active Duty (the AFEES survey) and the Services' Enlisted Master and Loss files. The unique aspect of the AFEES data is the richness of information available for analysis of first-term enlisted attrition. The survey contains much more systematic information on individual background factors and motivations at the time of enlistment than is available in the personnel files maintained by the services and DoD. The more detailed background information available in the AFEES helps fill two gaps in previous attrition research. First, the new variables illuminate the underlying behavioral relationships between demographic characteristics and attrition. Second, new information on recruit work history, on aspects of the military job match, and on job satisfaction provides insights about which individuals are high attrition risks and makes the analysis of early attrition more comparable to studies of job separations by young civilian employees.

The analysis of overall early attrition for all services combined suggests the following:

The work history of recruits before enlistment has an important bearing on early attrition. A spell of unemployment in the year before enlistment increases separation rates by 2.2 percent. Recruits who change jobs frequently before enlistment are more prone to early attrition. Other things equal, a 19-year-old recruit with four previous employers has a predicted separation rate of 12.7 percent compared with 9.6 percent for a recruit with a single previous employer.

Various indicators of military job match had no significant impact on early attrition. Factors like not qualifying for the desired kind of job, having pre-enlistment knowledge of job qualifications, or getting the job they preferred do not alter the likelihood of early attrition after controlling for other variables in the multivariate model. More general measures of job suitability, like satisfaction with the military job or even with the military itself, also had little influence on early separation.

The early attrition rates of non-high school graduates and recruits with a graduate equivalence diploma are 8 percentage points higher than the rates of high school graduates. Although this result is consistent with prior attrition research, the AFEES database can account for many previously unobserved variables, like work history and poor job matches,

65

which might have distorted the impact of high school graduation status on attrition. Although some of these new variables help to explain early attrition, they do not diminish the importance of high school graduation status in explaining early attrition.

After controlling for other factors, older recruits are more attrition-prone than younger recruits. Early attrition increases about 1 percentage point per year for each year beyond age 17 at enlistment.

How do the determinants of early military attrition and civilian separations of young workers compare? Work history, general aptitude, and minority status have similar impacts in both types of separations. There are, however, three factors that have quite different effects on the two groups. Age is directly related to early attrition but inversely related to civilian separations. Lack of education has a more significant and more pronounced negative impact on early attrition than on civilian separations. Finally, job dissatisfaction is consistently linked with civilian separation, but differences in job satisfaction (as measured on enlistment day) have no significant impact on the likelihood of early separation. These differences between the determinants of early attrition and civilian separations of young workers may reflect both institutional differences between the two sectors and differences in the individuals who choose employment in each.

In general, most factors have a similar influence on early attrition in all services. Blacks and Hispanics have lower early attrition rates than white non-Hispanics in all services, although the effect is significant only in the Army. AFQT has a statistically significant but quantitatively small negative influence in each service. High school diploma graduates are markedly more likely to survive the first six months than dropouts. While early attrition does not vary significantly by age in the Air Force, early attrition increases about 1, 2, and 4 percentage points per year with enlistment age beyond 17 in the Army, Navy, and Marines, respectively. Neither job satisfaction nor overall military satisfaction at the time of enlistment has a significant impact on early attrition in any service branch.

Variables characterizing prior work experience before enlistment have a qualitatively similar impact on early attrition in all services, although the magnitude and significance of the effects vary somewhat. Differences in work history before enlistment are significant predictors of early attrition in the Army, Navy, and Air Force. Navy and Air Force recruits with a spell of unemployment in the year preceding enlistment are 4 to 5 percentage points more likely to leave during the first six months. An extra job change for a 19-year old recruit in the Army or Air Force enhances his chances of early separation by 1.7 and 1.5 percentage points, respectively. (Author)

STUDY IDENTIFIER: CV85002
Heisey, J. G., Means, B., & Laurence, J. H. (1985). Military performance of low aptitude recruits: Project 100,000 and the ASVAB misnorming (FR-PRD-85-2). Alexandria, VA: Human Resources Research Organization.

Twice in the last two decades the Military has had an influx of low-aptitude personnel, once during Project 100,000 and once during the Armed Services Vocational Aptitude Battery (ASVAB) misnorming. These two groups of low-aptitude accessions provide a good source of information concerning how the Services have utilized such low-aptitude individuals and how such individuals have performed. This issue is of importance since the potential manpower shortage in the future may necessitate that the Services lower aptitude standards for enlistment.

This report reviews relevant research on low-aptitude individuals that has been done by or for the Services. In addition, it evaluates the measures of performance typically used to evaluate low-aptitude individuals and the comparison groups which have served as controls. (Author)

STUDY IDENTIFIER: CV85003
Bock, R. D., Gibbons, R., & Muraki, E. (1985). Full information item factor analysis (MRC Report #85-1). Chicago, IL: National Opinion Research Center.

A method of item factor analysis based on Thurstone's multiple factor model and implemented by marginal maximum likelihood estimation and the EM algorithm is described. Statistical significance of successive factors added to the model is tested by the likelihood ratio criterion. Provisions for effects of guessing on multiple choice items, and for omitted and not reached items, are included. Bayes constraints on the factor loadings are found to be necessary to suppress Heywood cases. Numerous applications to simulated and real data are presented to substantiate the accuracy and practical utility of the method. Analysis of the power tests of the Armed Services Vocational Battery shows statistically significant departures from unidimensionality in five of eight tests. (Author)

STUDY IDENTIFIER: CV86001
Lee, R., & Foley, P. R. (1986). Is the validity of a test constant throughout the test score range? Journal of Applied Psychology, 71(4), 644.

The effect of the magnitude of the mean predictor score on the validity coefficient, corrected for range restriction due to explicit selection, was studied from a sample of 68,672 Navy recruits. The predictor was the Armed Forces Qualification Test (AFQT) and the criteria were six non-AFQT tests of the Armed Services Vocational Aptitude Battery (ASVAB). We concluded that (a) the validity coefficients were generally higher at higher predictor score ranges, and (b) the validity, slope, and standard error of estimate should be viewed as an average rather than a constant value for all subjects in a population. (Author)

STUDY IDENTIFIER: CV87001
Prediger, D. J. (1987, December). Validity of the new Armed Services Vocational Aptitude Battery job cluster scores in career planning. The Career Development Quarterly, pp. 113-125.

Each year the Armed Services Vocational Aptitude Battery Form 14 (ASVAB-14) is administered to more than 1,300,00 students in approximately 14,000 high schools (U.S. Department of Defense, 1984). Students and high school counselors receive four occupational and three academic scores (called composites) for use in career planning. The four ASVAB-14 Occupational Composites are titled Mechanical and Crafts, Business and Clerical, Health, Social, and Technology, and Electronics and Electrical. The ASVAB-14 student score report links the Occupational Composites to examples of civilian occupations.

This study provides evidence of the validity of the ASVAB-14 composites and the validity of new ASVAB-14 Job Cluster Scales developed by the American College Testing Program (ACT) for use in the computer-based career-planning system called DISCOVER. The six ASVAB-14 Job Cluster Scales, which parallel Holland's (1985a) six occupational groups, combine ASVAB-14 composites with self-estimates of other abilities. (Author)

STUDY IDENTIFIER: CV87002
Prediger, D. J. (1987). Career counseling validity of the ASVAB job cluster scales used in DISCOVER. Iowa City, IA: American College Testing Program.

The purpose of this report is to provide evidence bearing on the career counseling validity of the Armed Services Vocational Aptitude Battery Form 14 (ASVAB-14) Composites and ASVAB-14 Job Cluster Scales composed of ASVAB-14 Composites and self-estimates of abilities. The six ASVAB-14 Job Cluster Scales were developed by the American College Testing Program (ACT) for use in interpretation procedures based on the profile similarity model to relate scores on the ASVAB-14 Job Cluster Scales to career (occupational and educational) options appropriate to a counselee's pattern of tested and self-estimated abilities. Both cognitive and non-cognitive abilities are included.

If DISCOVER's use of the profile similarity model for ASVAB-14 interpretation is justified, the ability profiles for diverse career groups must differ in appropriate ways. The results of four validity studies are described. The first (N = 290) and second (N = 1,001) were concurrent validity studies with criterion groups based on occupational choice. The third (N = 1,650) was a longitudinal study with criterion groups based on occupational membership. The fourth (N = 4,607) was a longitudinal study with vocational, and technical colleges.

Three of the studies address the validity of scores obtained from various combinations of tested and self-estimated abilities. Only the first study included ASVAB-14 Composites and ASVAB-14 Job Cluster Scales. However, the other three studies provide a context for judging the relevance of ability measures, in general, and ASVAB-14 Job Cluster Scales, in particular, to career counseling based on the profile similarity model.

Across the four studies, multivariate analyses of variance, discriminant analyses, hit rate analyses, and career group profile comparisons showed that career groups differ significantly on abilities and that the differences generally make good sense. When tested abilities are combined with self-estimated abilities, greater group differentiation is obtained than when tested abilities are used alone. Typically, three or four independent ability factors are needed to account for career group differences. General cognitive ability was found to be of secondary importance.

Career group differences on the seven ASVAB-14 Composites were relatively small. Of 21 diverse career groups (e.g., arts, social service, science), 18 scored highest on the Business and Clerical Composite. In contrast, the ASVAB-14 Job Cluster Scales were among the best differentiators of career groups. The scales with peak scores corresponded with predominant work tasks for 20 of the 21 career groups.

Overall, results for the four studies show that career groups differ substantially and sensibly on a wide variety of abilities. Such results support a two-step approach to the use of ability measures in career counseling. First, use the profile similarity model to identify career groups (e.g., ACT Job Families) with ability profiles appropriate to the counselee. Second, within those career groups, search for occupations with profile levels appropriate to the counselee (e.g., occupations attainable through further education, training, or experience). (Author)

STUDY IDENTIFIER: CV87003
Camara, W. J., & Laurence, J. H. (1987). Military classification and high aptitude recruits (HUMRRO-FR-PRO-87-21). Alexandria, VA: Human Resources Research Organization.

This report documents the occupational classification process for military enlistees and job assignment process as it affects high aptitude recruits. Such recruits are more sought after than their lower aptitude counterparts and thus they have definite advantages in getting their occupations of choice. Generally high aptitude recruits are concentrated in technologically and cognitively complex jobs. (Author)

STUDY IDENTIFIER: CV87004
Ramsberger, P. F., & Means, B. (1987). Military performance of low aptitude recruits: A reexamination of data from Project 100,000 and the ASVAB misnorming period (FR-PRD-87-31). Alexandria, VA: Human Resources Research Organization.

The purpose of this study was to examine the services recent history with lower-aptitude personnel, specifically in Project 100,000 and in the ASVAB Misnorming period. Two questions were addressed: "To what extent was there a negative impact on the services?" and "How did the low-aptitude recruits perform in jobs of varying complexity?" The individuals of interest in this study are designated in Category IV (below-average) according to the AFQT. The range for this percentile group is 10 to 30 based on a nationally representative sample of 18 to 23 year old men and women tested in 1980.

During 1967-1971, a total of 354,000 men were admitted into the service under this program. Nine percent entered under lowered physical standards, the remainder were classified as New Mental Standards (NMS) men. Three sets of analyses were carried out: Comparisons of the NMS men and the entire control groups selected by the services. Comparisons of the NMS men and only that portion of the control group comprised of those minimally (but fully) qualified for service under standards over the course of Project 100,000. Comparisons within selected military jobs (as defined by the DDOC codes). The findings for Project 100,000 can be summarized as follows: The NMS men did not perform as well as the overall control group. These differences remained even with comparison to those in the lowest aptitude-qualified category. For within-job comparisons, there proved to be fewer differences between NMS men and the controls when performance was examined.

During the period of misnorming (1976-1980) substantial numbers of low-aptitude individuals were admitted into the Services. Analyses were carried out: To compare overall performance of Potentially Ineligibles (PI's) and the control group (composed of those with the lowest acceptable aptitude/educational characteristics). To compare performance of the PI's with the control groups within complexity categories. The performance variables were attrition, promotion, reenlistment eligibility and reenlistment propensity.

The findings included: Little variance in the performance of the PI's and the control groups on any of four variables. Large differences were found between High School graduates and nongraduates. In regard to job complexity, performance as indicated by the four variables was better in medium and high complexity occupations than low complexity occupations.

Overall it is clear that in certain key respects, Project 100,000 participants did not perform as well as others in the Service at that time. On the other hand, there is little evidence suggesting that the PI's performance was different than that of minimally qualified Service members. (Contractor)

STUDY IDENTIFIER: CV87006

Flyer, E. S. (1988). Characteristics and behavior of recruits assigned to highly sensitive positions (FR-88-01). Alexandria, VA: Human Resources Research Organization, International.

This report provides information on recruits entering service over a five year period--1978 through 1982--and focuses on those selected for highly sensitive positions within their first six months of active duty. Information is provided on the number and type of recruits passing initial prescreening procedures for these positions, those recruits whose later background investigations revealed serious derogatory information, and those discharged later for unsuitability. (Author)

STUDY IDENTIFIER: CV88001

Jones, G. E. (1988). Investigation of the efficacy of general ability versus specific abilities as predictors of occupational success. Unpublished master's thesis, St. Mary's University, San Antonio, TX.

The hypothesis tested was whether the extent to which a subtest in a multiple aptitude test battery is g-loaded will be related to the magnitude of that subtest's criterion-related validity. Four subhypotheses were also tested which examined the relationship within four job categories: Mechanical, Administrative, General, and Electronic. The predictors were the subtests of the Armed Services Vocational Aptitude Battery and the criterion was training success. The g-loadings were derived through a principal components analysis of the scores from a nationally representative sample of the American youth (N = 11,914). The criterion-related validities for each subtest were from 37 high flow Air Force technical training schools (N = 24,482) representing a wide diversity of jobs. Through meta-analytic techniques average validities of the subtests were calculated across all jobs and then within each of the four job categories. The average validities were then rank order correlated with the ranking of the subtest's g-loading. In all five cases the results were significant at the .05 level. The data show general cognitive ability to be an important single predictor of job success, but the data are not conclusive enough to completely dispute specific abilities as valid predictors. Additional moderator analysis and examination of the second factor of the two factor principal components analysis is discussed, and further research is recommended (Author)

STUDY IDENTIFIER: CV88002

Eddy, A. S. (1988). The relationship between The Tacit Knowledge Inventory for managers and the Armed Services Vocational Aptitude Battery. Unpublished master's thesis, St. Mary's University, San Antonio, TX.

This research study was conducted to contribute to the new initiative in testing of the Air Force Manpower and Personnel Division of the Human Resources Laboratory, Brooks Air Force Base, Texas. This new initiative includes areas such as leadership and management potential. Specifically, this thesis examined the relationship between the Armed Services

70

Vocational Aptitude Battery (ASVAB) and the Tacit Knowledge Inventory for Managers (TKIM) which is currently a research instrument. The TKIM purports to measure practical intelligence rather than academic intelligence, so no relationship between the ASVAB and TKIM was expected through correlational analysis. In addition, a factor analysis was expected to a yield a separate factor for the TKIM along with the four factors usually found for the ASVAB. The results of the study indicate that there is little relationship between the subtests of the ASVAB and the TKIM. Estimates of the reliabilities of the TKIM total score and separate item clusters demonstrated nonhomogeneous items. Although tacit knowledge was found to be an attribute independent of the ASVAB and perhaps academic intelligence, it may just be one of many elements that contribute to occupational success. The measurement of tacit knowledge holds promise, and the authors of the TKIM could fulfill this promise with additional rigorous research and development. (Author)

STUDY IDENTIFIER: CV88003
Stermer, N. S. (1988). Meta-Analysis of Armed Services Vocational Aptitude Battery composite validity data. Unpublished master's thesis, St. Mary's University, San Antonio, TX.

This study investigated the efficacy of selection procedures associated with the Armed Services Vocational Aptitude Battery (ASVAB). The main hypothesis tested was whether the Armed Forces Qualification Test (AFQT), an ASVAB composite, is a valid predictor of training success. Additional hypotheses investigated whether the AFQT is a more valid predictor of training success than the individual career-specific selector composites. A final hypothesis dealt with the expectation that the AFQT would show a larger improvement over selector composites in validities for females than for males.

Results indicate the AFQT has high predictive validity for all military occupations included in the sample. Differential validity is observed to favor three of the four ASVAB composites (Mechanical, General, and Electronic). For the fourth composite, (Administrative), the AFQT has higher validity, and the increment does favor females. Two possible explanations for the findings are discussed. The need for continued research is indicated. (Author)

STUDY IDENTIFIER: CV88004
Waters, B. K., Barnes, J. D., Foley, P. P., Steinhaus, S. D., & Brown, D. C. (1988). Estimating the reading skills of military Applicants: Development of an ASVAB to RGL conversion table (HumRRO FR-PRD-88-22). Washington, DC: Human Resources Research Organization.

The objectives of this study were to:

- Measure the reading ability of military applicants using six reading tests.
- Select one ASVAB composite (anchor) with which to equate the reading tests.
- Equate each reading test to the anchor.
- Recommend a RGL scale for DoD reporting purposes.

Twenty thousand, four hundred and twenty-two applicants for military service were administered one of six published reading ability test (the Gate MacGinitie Reading Tests, the Nelson-Denny Reading Test, the Test of Adult Basic Education, the Adult Basic Learning Examination, the Stanford Test of Academic Skills, or the Air Force Reading Abilities Test), along with the Armed Services Vocational Aptitude Battery (ASVAB). Tests were given at

15 Military Entrance Processing Stations (and their associated 214 Mobile Examining Team sites) during a six week period in Spring, 1987. Order of ASVAB or reading test administration was counterbalanced across testing sessions.

Five ASVAB composites were selected as potential equating anchors. Possible reading test-ASVAB composite combinations were evaluated in terms of intercorrelations, indices comparing the similarity of test score distributions, test reliability, and accuracy of equatings. ASVAB VE was selected as the best anchor test score for the equating. Finally, a proposed DoD RGL scale was developed from the RGL scales of the five reading tests which were adequate for equating purposes. Study conclusions were:

- Different reading tests yield quite different estimates of an individual's reading ability.
- The median RGL of military applicants is 10.9 using the proposed DoD RGL scale.
- ASVAB VE (WK + PC) is the best anchor test for equating ASVAB to the reading tests.
- The distribution of AFRAT total reading scores was closest to the distribution of ASVAB VE scores of the reading tests in the study.
- The "best" RGL scale for DoD use would be the average RGLs of the five reading test RGL scales appropriate for equating to the ASVAB.
- The database from the RGL study should be extremely valuable for future reading research.

The final products of the study are raw score conversion tables which provide a single DoD RGL scale for each of five reading tests. The tables will be useful for military accession policy analysts, testing researchers, military recruiting personnel, and civilian educators for estimating individual examinee or group reading ability from ASVAB scores or scores from any of the five reading tests. They also will provide a single RGL scale for DoD reading ability reporting purposes. The resulting database will be a powerful research tool for better understanding the nature of reading ability and its relationship to aptitude and reading test scores. (Author)

VII. UNITED STATES MARINE CORPS

STUDY IDENTIFIER: MC74001
Lockman, R. F. (1974). Enlisted selection strategies (CNS-78-1039, AD-A014 576). Arlington, VA: Center for Naval Analyses.

The efficiency and fairness of procedures used to select enlisted men for the Navy and for schools, jobs, and advancement are examined. The literature on selection-testing, training, and performance evaluation is reviewed. Ways of increasing personal performance and opportunity are suggested. (Author)

STUDY IDENTIFIER: MC78001
Sims, W. H., & Mifflin, T. L. (1978). A factor analysis of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 6 and 7 (CNA-78-3092). Arlington, VA: Center for Naval Analyses.

We have carried out a factor analysis of forms 6 and 7 of the ASVAB for its possible relevance to other studies and analyses. All service composites and individual ASVAB tests were included in the analysis. A knowledge of the common factors and unique parts of each test (coupled with validation analyses) will provide insight into: the construction of improved composites, alternate versions of the AFQT score, and possible changes in subsequent versions of ASVAB.

The composites were found to be dominated by a single common factor. The individual ASVAB tests were found to contain four common factors. We identified these factors as verbal, math, shop, and attitudinal.

The results also suggest that there is a high degree of redundancy in the test battery and in some sets of composites. (Author)

STUDY IDENTIFIER: MC78002
Sims, W. H. (1978). An application of factor analysis to the construction of improved classification composites from the Armed Services Vocational Aptitude Battery (ASVAB) Forms 6 and 7 (CNA-78-3094). Arlington, VA: Center for Naval Analyses.

We have carried out an analysis to develop an improved set of composites from forms 6 and 7 of the Armed Services Vocational Aptitude Battery (ASVAB). Our goal is to construct a set of composites that combine a high validity with high differentiation.

The contents of the composites are limited by the attributes actually measured by the ASVAB. A factor analysis indicates that the tests in ASVAB actually measure four common factors (Math, Shop, Verbal, and Attitude), in addition to small amounts of elements unique to each test.

The contents of this report may be summarized as follows: the predictive power of the ASVAB is found to be concentrated in the four common factors. The elements unique to each test add little or nothing to the predictive power of the test battery. Since the predictive power of the ASVAB is contained in the common factors, it follows that the 16 tests that make up the battery can be viewed as building blocks for composites only in terms of their common factor content. Hence, a decision on which of two tests to include in a composite should be based on the proportion of a desired common factor in the test, rather than on any unique attribute measured by the test. The concentration of predictive power in the common factors and the observation that the factors could be calculated from fewer than 16 tests indicates that the test battery could be shortened with little loss of predictive ability. The choice of particular tests to be removed may be influenced by a need for redundancy between the AFQT score (which is subject to compromise) and other tests with similar content (which are not likely to be comprised and hence will be highly useful for classification). The AFQT composite is the primary recruit screening score for all services. The Shop, Math, and Verbal factors are each important predictors of school performance, with Math and Verbal being the most important. It would, therefore, seem reasonable to include in the AFQT composite, tests that contain these factors in the appropriate proportions. Each set of composites currently used by the Armed Services has shortcomings either in terms of validity or differential reliability. An improved set of composites has been constructed from combinations of the "pure" factors, consisting of Math-Shop (MS), Math-Verbal (MV), and Verbal-Shop (VS). This set appears equal in validity to the best of the current sets of composites and superior in its degree of differentiation. We recommend its eventual use for the classification of recruits. Our best current estimate of the composite to use for each course is given in table 3. The collection of validation data on Marine Corps recruits is continuing through December 1978. At the conclusion of that effort, data will be available to extend the validation analysis to more courses and to more accurately determine which of the factor composites in the recommended set are best for each course. We recommend the deferral of major changes in the Marine Corps classification procedure until the full data set is analyzed. Near term improvements in the classification of Marine Corps recruits are discussed, and changes in three courses are suggested. (Author)

STUDY IDENTIFIER: MC78003
Sims, W. H. (1978). Interim results of an examination of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 6 and 7 for the classification of Marine Corps recruits (CNA-78-3081). Arlington, VA: Center for Naval Analyses.

This report contains interim results of our analysis of the Armed Services Vocational Aptitude Battery (ASVAB) as a predictor of the school performance of Marine Corps recruits.

Validity coefficients -- the correlation between ASVAB scores and school performance -- are calculated for all ASVAB individual tests and for all ASVAB composites currently used by the Army, Navy, Air Force and Marine Corps.

The following observations may be made: Mean corrected validity coefficients from ASVAB are 0.6. This mean is almost identical to that observed in an analysis of the classification battery previously used by the Marine Corps (ACB-61). The Navy ASVAB composites tend to have slightly larger corrected validities than do those of the other services. The Navy Electronics (E) composite is a very strong predictor of success--even in non-electronics schools. The most powerful ASVAB individual test is Mathematics Knowledge (MK). The Space Perception (SP) test is important only for a few courses. This limited utility probably does not require its continued inclusion in the AFQT score. The excellent validities achieved using the 4 Navy composites suggests that good classification may be possible using only a

using the 4 Navy composites suggests that good classification may be possible using only a small set of well-chosen composites. Regression analysis of the ASVAB individual tests suggests that improved composites could be constructed for some courses. Some ASVAB individual tests appear to be redundant and/or unimportant. Selective elimination of these could save some testing time with little sacrifice in classification accuracy. (Author)

STUDY IDENTIFIER: MC81001
Sims, W. H., & Hiatt, C. M. (1981). Validation of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 6 and 7 with applications to ASVAB Forms 8, 9, and 10 (CNS-1160). Alexandria, VA: Center for Naval Analyses.

This report examines the validity of the Armed Services Vocational Aptitude Battery (ASVAB) forms 6 and 7. Validity in this analysis is the correlation between ASVAB test scores and subsequent performance in military training courses.

Recruits are assigned to specific military training based, in part, on their scores on subgroups of tests (aptitude composites) contained in the ASVAB. We determined the most appropriate aptitude composite, and minimum acceptable score on that composite, for assignment to each training course.

ASVAB forms 6 and 7 (the source of test score data for this analysis) are compared with the recently introduced ASVAB forms 8, 9, and 10. Based on this comparison we consider the results of our validity analyses of ASVAB forms 6 and 7 to be applicable for recruit assignment using ASVAB forms 8, 9, and 10. (Author)

STUDY IDENTIFIER: MC81003
Marcus, A. J., & Lockman, R. F. (1981). Alternative enlistment standards (CNA-81-448, AD-A101 376). Alexandria, VA: Center for Naval Analyses.

In this paper, the possibility of employing alternative enlistment standards to increase the supply of recruits to the Navy was examined. Four types of changes to current standards were analyzed. They include using tests from the ASVAB not currently included in the AFQT as additional predictors of retention, analyzing the value of various types of enlistment waivers, using measures of the quality of high school equivalency diplomas, and screening Class A school and apprenticeship trainees separately. All of these changes in enlistment standards would be low-cost initiative.

No large benefits to using additional ASVAB tests to screen recruits are found. However, current waiver policies should be maintained and perhaps expanded somewhat as a partial answer to future manpower shortfalls. Adjusting eligibility requirements to allow for measures of GED quality could lead to small increases in supply as well. More efficient matching of Class A school guarantees and attendance could lead to increases in recruit retention. Finally, separate screening of Class A school and apprenticeship trainees has potential for cost savings for the Navy. (Author)

STUDY IDENTIFIER: MC82001
Maier, M. H. (1982). Issues for defining ASVAB 11/12/13/14 aptitude composites (A briefing presented to the ASVAB working Group, 7-9 December 1982) (CNA-82-3199/27). Alexandria, VA: Center for Naval Analyses.

This publication documents a briefing which addressed several areas germane to the development of composites for the ASVAB 11, 12, 13 series. The questions included the possibility of increasing the mathematical content of the Administrative/Clerical composite, the proper method of establishing the high school composites, and the proper method of establishing the military selector composites. Synopsis of the Method (Subjects, variables, analyses): The methods used for this study involved mainly the reanalysis and consideration of extant data.

The author shows that the Administrative/Clerical composite can be increased in validity from about .6 to about .65 by changing its composition to WK+CS+MK. The validities of ASVAB 11, 12, 13 are expected to be similar to those of the 8, 9, 10 series, since the subtests were designed to be parallel to the subtests of the 8, 9, 10 series. Since the validities of the 8, 9, 10 series are higher than those of the 6, 7 series, an immediate change is not needed. The differing purposes to which the high school ASVAB results are put by guidance counselors is shown to complicate the process of deciding on appropriate high school composites. A consideration of the two purposes of the ASVAB, selection and classification, involves a discussion of the different conceptions of classification, and the choice of an appropriate method for use by the Marine Corps and the services in general. Emphasizing the theories of Brogden, it is shown that it is not necessarily detrimental to the effectiveness of a test battery to use intercorrelated selector composites. Consideration is given to the pros and cons of using full multiple regression, as opposed to simple summing, in the optimization of selector composites. It is concluded that the gains from doing so would be less than the associated disadvantages

The author recommends considering a change in the Administrative/Clerical composite. The definition of both the military and the high school composites should await the completion of the 8, 9, 10 validation studies. Composites should be made up of three or four subtests, and should usually be simple sums of the subtest scores. Moreover, the composites should have face validity. The value of including PC in the ASVAB should be reconsidered, since it contributes little unique variance beyond that contributed by WK. Finally, the advantages to be gained by applying the theory of classification efficiency are important enough to justify its use. (Contractor)

STUDY IDENTIFIER: MC82002
Truss, A. R., Hiatt, C. M., & Sims, W. H. (1982). An analysis of correlations between the Armed Services Vocational Aptitude Battery (ASVAB) Forms 5/6/7 and Forms 8/9/10 (CNA-82-3095/11). Alexandria, VA: Center for Naval Analyses.

Since January 1976 all of the armed services have used the Armed Services Vocational Aptitude Battery (ASVAB) to measure the mental aptitude of prospective recruits. Forms 6 and 7 of ASVAB (ASVAB 6/7) were used from 1 January 1976 until 1 October 1980 when they were replaced by forms 8, 9, and 10 (ASVAB 8/9/10).

In this report we tabulate and examine the correlations between subtests and composites in ASVAB 6/7 with like-named subtests and composites in ASVAB 8/9/10.

The results may be summarized as follows: Subtests in ASVAB 8/9/10 correlate well with like-named subtests in ASVAB 6/7 (correlation coefficients on the order of 0.8) Composites in ASVAB 8/9/10 correlate well with like-named composites in ASVAB 6/7 having the same subtest content (0.94) Like-named composites whose subtest content was changed in the shift from ASVAB 6/7 to ASVAB 8/9/10 show battery-to-battery correlation coefficients ranging from 0.79 to 0.92 The Armed Forces Qualification Test (AFQT) from ASVAB 6/7 and ASVAB 8/9/10 correlate reasonably well with a coefficient of 0.88. This coefficient increases to 0.90 if the Mechanical Comprehension (MC) subtest is added to the ASVAB 8 AFQT. The within-battery correlation of the composites used by the services generally increased with the transition from ASVAB 6/7 to ASVAB 8/9/10. The correlations are sufficiently large to suggest that the number of different composites is excessive. (Author)

STUDY IDENTIFIER: MC83001

Maier, M. H., & Truss, A. R. (1983). Validity of ASVAB Forms 8, 9 and 10 for Marine Corps training courses: Subtests and current composites (Memorandum No. 83-3107). Alexandria, VA: Center for Naval Analyses.

INTRODUCTION

New versions for the Armed Services Vocational Aptitude battery, forms 8,9, and 10 (ASVAB 8/9/10), were introduced on 1 October 1980. The ASVAB is used by all military services to select and classify recruits. The ASVAB consists of ten subtests that are combined to produce an Armed Forces Qualification Test (AFQT) score and aptitude composite scores. The AFQT is used to help select recruits and to help manage and report the mental aptitudes of military recruits. Aptitude composites are used to classify recruits according to their aptitude for different types of jobs or specialties and as prerequisites for assigning recruits to specialty training courses.

The purpose of this research effort was to: Validate ASVAB 8/9/10 subtests as predictors of grades in job specialty training courses. Define aptitude composites, in terms of the subtests in each, that maximize their predictive validity against training grades. Evaluate the composites reported to high schools that participate in the High School Testing Program.

Validity coefficients were computed for each course that had 100 or more Marine students with ASVAB 8/9/10 test scores and a training grade that reflected competence in the specialty. The current clustering of specialties used by the Marine Corps was retained in our analysis. All specialties in a cluster have the same aptitude composite as a prerequisite. The validity coefficients were corrected for prior selection of the students assigned to each course. The corrected coefficients are estimates of the validity if the students in each course were representative of the full population from which they were drawn. The stepwise regression procedure was used to select the subtests in each composite that had the highest unique validity.

RESULTS VALIDITY OF ASVAB 8/9/10

The predictive validity of ASVAB 8/9/10 is satisfactory for selecting and classifying Marine Corps recruits. The mean validity coefficients for each subtest, corrected to be population estimates, are shown in table I. The mean validity coefficients for the current Marine Corps aptitude composites are shown in table II; these coefficients also are corrected

to be population estimates. The mean validity coefficients for each aptitude composite against the appropriate cluster of specialties is .60 or higher, except for the Combat composite, which is .47. These values are consistent with those traditionally found for predicting performance in military training courses.

DEFINITION OF MARINE CORPS APTITUDE COMPOSITES

The predictive validity of Marine Corps aptitude composites could be improved somewhat by changing the subtests that define the composites. The Marine Corps currently uses six composites, defined in table III, as prerequisites assigning recruits to specialty training courses. The current definitions are based on validity data for the predecessor version of the ASVAB (forms 5, 6, and 7), combined with expert judgment when the validity data were of limited usefulness for the ASVAB 8/9/10 subtests.

On the basis of the subtests selected for each composite using the stepwise regression procedure, we have developed improved definitions of the aptitude composites. These are labeled "proposed" in table III. The proposed definitions are tentative, pending further analysis and policy decisions about the content of the ASVAB and clusters of specialties.

The proposed Clerical composite has a substantially higher validity than the current one (validity coefficients of .65 versus .60). The current Electronics Repair composite was not changed. The other composites have small changes in the subtests and in the validity coefficients. The proposed Combat and General Technical composites are identical, which means that the two clusters would in effect be merged and the number of composites reduced from six to five. By changing the Clerical composite, the classification of Marine recruits would be significantly improved. Changing the other composites is not as important and could be done at a convenient time.

HIGH SCHOOL COMPOSITES

The ASVAB has been administered in high schools since the first version was developed in the late 1960s. The ASVAB administered in high school is used to determine qualification for enlistment in the military services and for vocational guidance in the civilian environment. Form 5 of the ASVAB has been used in the High School Testing Program since school year 1976-77. Factor composite scores, called Verbal, Quantitative, Technical, and Speed, plus an Academic Aptitude score, have been reported to high schools since school year 1977-1978. A new set of occupational composites have been tentatively proposed for reporting to high schools, beginning in school year 1984-1985. In table IV we show the proposed definitions and predictive value of the factor and occupational composites that would be introduced in school year 1984-1985.

The proposed occupational composites have high validity for predicting success in relevant Marine Corps specialty training courses. The proposed factor composites have lower predictive validity t' an the relevant occupational composites.

Both sets of composites can be reported to high schools. The factor composites can be used to describe relative strengths and weaknesses of the high school students, and the occupational composites can be used to predict performance in vocational training programs and on the job.

CONCLUSIONS

The predictive validity of ASVAB 8/9/10 is satisfactory. The proposed Marine Corps aptitude composites are improvements over the current ones. The potential improvement in the Clerical composite is particularly significant and it should be changed expeditiously. Job specialty training grades in the Marine Corps are an adequate criterion for validating the ASVAB and should be maintained routinely for all recruits. Both the factor and occupational composites should be reported to high schools.

DISCUSSION

One reason the proposed composites in tables III and IV are labeled tentative is that the two speeded subtests in the ASVAB (Numerical Operations and Coding Speed) have undesirable measurement properties. Their scores are affected by testing conditions: people who have practiced taking the items get higher scores; people tested in a military testing environment get higher scores than when tested in a civilian environment. The power subtests, in which most examinees have time to attempt every item, do not show the same type of fluctuations. From the point of view of predicting performance in Marine corps training courses, the Numerical Operations subtest could be deleted from the battery because it has little unique validity. The status of these two subtests is currently under review, and the aptitude composites cannot be defined until their place in the ASVAB is determined.

The high predictive validity of ASVAB 8/9/10 does support its continued used for selecting and classifying military recruits and for use in vocational guidance and counseling of high school students. Improvements can be made to the aptitude composites and in the speeded tests, but these should be viewed as refinements to an already satisfactory testing program. (Author)

STUDY IDENTIFIER: MC83002
Maier, M. H. (1983). The predictive validity of the AFQT for Forms 8, 9, and 10 of the ASVAB (CNA-83-3163/27). Alexandria, VA: Center for Naval Analyses.

The purpose of this report is to present the predictive validity of the Armed Forces Qualification Test (AFQT) and compare it to the predictive validity of the Marine Corps and high school composites. Across the range of job requirements, the AFQT has high validity (mean validity coefficient of .59), which supports using it as a measure of general trainability. For the related clusters of specialties, the Marine Corps aptitude composites have higher validity (mean validity coefficient of .63 for a set of tentatively proposed composites, .64 for a set of occupational composites to be used in the High School Testing Program). The high validity of the composites supports the differential validity of the ASVAB. Currently, the AFQT contains scores from the highly speeded numerical operations subtest. The numerical operations scores have been shown to be affected by testing conditions. Because personnel managers widely use the AFQT scores, the place of speeded items in the AFQT needs to be thoroughly reviewed. (Author)

STUDY IDENTIFIER: MC83004
Stoloff, P. H. (1983). A factor analysis of ASVAB Form 8A in the 1980 DoD reference population (CNA-83-3135/25). Alexandria, VA: Center for Naval Analyses.

A factor analysis of the correlations of ASVAB 8A subtest raw scores, collected on a nationally representative youth sample, was performed to determine the scope of abilities being measured by the battery. The results were compared to those obtained with two samples of military applicants.

The results suggest that ASVAB 8A (and by implication, forms 8, 9, and 10) are composed of four correlated common factors. These factors are "Verbal," Speed," "Math," and "Technical." The moderately high and uniform correlations among the factors suggests that a global ability or aptitude is being measured by each of the ASVAB subtests. This factor structure is similar to that found in the military applicant samples.

It was concluded that the factor structure emerging from this analysis could be used as evidence of the battery's construct validity: it seems to be measuring what the test builders had in mind. The results obtained in the civilian population could be extended to male military applicants. (Author)

STUDY IDENTIFIER: MC84001
Maier, M. H., & Truss, A. R. (1984). Validity of the occupational and academic composites for the Armed Services Vocational Aptitude Battery, Form 14, in Marine Corps training courses (Memorandum No. 84-3043/2). Alexandria, VA: Center for Naval Analyses.

The purpose of this report is to present results on the validity of the occupational and academic composites of the version of the ASVAB (Form 14) used in the DoD Student Testing program. The validity of these two broad types of composites for predicting training performance of Marine Corps recruits was examined, as well as the effects of ethnicity, gender, and education level on the validity of these composites. The authors also computed chance of occupational success using occupational difficulty and composite validity estimates.

Standard correlational and regression techniques were used to examine validity relationships of seven High School composites to final technical school grade in 23 Marine Corps training courses. Effects of gender, ethnicity, and education level on validity were analyzed using a linear models analysis. "Chances of doing well" in the courses analyzed in this study were examined using an index of how difficult it was to learn the occupation. Courses were grouped by difficulty and chances of doing well (defined as .60 to .85 probability of performing successfully) by aptitude.

No consistent over- or underprediction of performance for minority groups or females was found. Three of 23 Courses studied showed slight overprediction for whites; and two of 23 courses had overprediction for minorities. Some underprediction against females was noted for traditional female occupations. Validity data for the seven composites were presented and chances of doing well in the 23 occupations studied were presented as a function of ASVAB occupational composite score.

The authors concluded: 1. "The occupational composites have high validity for predicting performance in training courses for appropriate groups of occupations." 2. "The occupational composites appear to be free of bias against social/ethnic minorities in all groupings of occupations." 3. "The occupational composites appear to be free of bias

against females in nontraditional female occupations, such as mechanical maintenance and electronics repair, but they appear to be biased against females in some traditional female occupations, such as clerical and food services." (p. vii-p. viii) (Contractor)

STUDY IDENTIFIER: MC84002
Maier, M. H., & Hiatt, C. M. (1984). An evaluation of using job performance tests to validate ASVAB qualification standards (CNR-89). Alexandria, VA: Center for Naval Analyses.

The purpose of this study was to evaluate the feasibility of validating ASVAB enlistment standards against job performance. Hands-on and written proficiency tests were developed for three Marine Corps skills--Ground Radio Repair, Automotive Mechanic, and Infantry Rifleman--for use as measures of job performance. In addition, grades in skill training courses were also evaluated as possible measures of job performance.

The ASVAB was shown to be a valid predictor of job performance. All three measures-- hands-on tests, written tests, and training grades--were generally consistent measures of performance. A preliminary set of ASVAB qualification standards for assigning recruits to these three skills was computed using the hands-on and written tests as the criterion measure. The ASVAB standards derived from this analysis are similar to the standards based on the traditional criterion measure of training-course grades. We conclude that validating ASVAB enlistment standards against job performance appears to be feasible. Although job performance tests can be used for this purpose, they are costly to develop and administer. Training grades, which are routinely available, may serve as a satisfactory and economical proxy for them in many skills. (Author)

STUDY IDENTIFIER: MC85001
Maier M. H. (1985). Effects of truncating a reference population on correction of validity coefficients for range restriction (CRM-85-40). Alexandria, VA: Center for Naval Analyses.

Correlation coefficients based on samples from occupational specialties that differ in qualification standards cannot be compared. The sample coefficients need to be put on the same metric by correcting them to a common reference population. The purpose of this analysis is to evaluate the effects of truncating the reference population on the correlation coefficients and on the intercorrelation of performance measures. Population-wide estimates were computed in the full population and in the truncated population with the bottom 10 percent deleted. (Author)

STUDY IDENTIFIER: MC85002
Maier, M. H., & Truss, A. R. (1985). Validity of the Armed Services Vocational Aptitude Battery Forms 8, 9, and 10 with applications to Forms 11, 12, 13, and 14 (CNR-102). Alexandria, VA: Center for Naval Analyses.

The Armed Services Vocational Aptitude Battery (ASVAB) was validated against training grades in 34 Marine Corps occupational specialties. Four aptitude composites for assigning Marine recruits to occupational specialties were developed and evaluated. The high predictive validity of the ASVAB supports its continued use for selecting recruits and assigning them to occupational specialties.

The fairness of the aptitude composites as predictors of performance was evaluated for racial/ethnic minorities and females. (Author)

STUDY IDENTIFIER: MC86001

Maier, M. H., & Curia M. D. (1986). Validity of the ASVAB for predicting performance in Marine Corps training courses: Gender differences (CRM-86-179). Alexandria, VA: Center for Naval Analyses.

Females tend to have higher performance than males in clerical and food services training courses, when aptitude scores are held constant. To help account for the differences, educational level and interest in clerical-type activities are included in this analysis, along with aptitude composite scores. A recommendation is made about adjusting aptitude qualifying scores for females. (Author)

STUDY IDENTIFIER: MC86002

Horne, G. E. (1986). Evaluation of alternative compositions of the Armed Forces Qualification Test (AFQT) (CRM-86-111). Arlington, VA: Center for Naval Analyses.

The Armed Services Vocational Aptitude Battery (ASVAB) is used by all branches of the Armed Services to measure the mental aptitude of applicants for enlistment. Certain subtests from the ASVAB are combined to form the Armed Forces Qualification Test (AFQT). The AFQT is used to classify applicants into categories of general trainability. It is used to screen out lower ability applicants as well as to determine if enlistment guarantees and bonuses are to be awarded.

The current AFQT includes the Numerical Operations subtest, which is a speeded test. Scores on speeded subtests have been shown to be extremely sensitive to such factors as type font, answer sheet configuration, practice, and administrative procedures. In addition, the Numerical Operations subtest has little or no unique validity as a predictor of general trainability. Because of these problems, the services are evaluating ASVAB composites as candidates to replace the current AFQT. Seventeen alternatives were considered.

The purpose of this study was to determine which of these alternative AFQTs are the most desirable. The major criteria used in this determination were as follows:

- Predictive validity should be maximized.
- Negative effects on population subgroups such as females and blacks should be minimized.

Other criteria examined were the number of items and the content (i.e., constructs) of subtests included in each alternative composite.

Predictive validity was studied using final course grades in 34 Marine Corps Occupational Specialty (MOS) training courses. In examining the effects of the alternatives on population subgroups, two sets of data were studied independently. These data sets were the 1980 Youth Population and Marine Corps applicants for FY 1985. Both data sets generally lead to similar conclusions. Where differences do exist they seem attributable to the inflation of speeded test scores in the applicant data by practice effects or test taking strategy. For this reason, primary reliance is placed on results based on the 1980 Youth Population data set.

Based on the two major criteria, three alternatives (see table I) are clearly superior. The alternative consisting of Verbal + Arithmetic Reasoning + General Sciences + Math Knowledge best satisfies the evaluation criteria. This alternative:

- Equals or exceeds the predictive validity of the current AFQT for all MOS clusters.
- Is among the most satisfactory in terms of effects on the potential applicant pool (Author)

STUDY IDENTIFIER: MC86005
Maier, M. H., & Sims, W. H. (1986). The ASVAB score scales: 1980 and World War II (CNR-116). Arlington, VA: Center for Naval Analyses.

This report describes the construction of a new score scale for the Armed Services Vocational Aptitude Battery (ASVAB). The ASVAB was administered to a nationally representative sample of young adults in the fall of 1980. The test scores for this sample were used to construct the new score scale, called the 1980 ASVAB score scale. The 1980 score scale replaced the World War II scale, used by the Department of Defense (DOD) since 1950, on 1 October 1984. The new score scale provides nationally representative test norms that enable DOD personnel and manpower managers to compare the aptitudes of military recruits with those of the potential supply of recruits in the civilian youth population. (Author)

STUDY IDENTIFIER: MC86006
May, L. J. (1986). Educational quality requirements for Marine Corps enlisted personnel (CNR-121). Arlington, VA: Center for Naval Analyses.

This report sets forth a methodology for determining the optimal educational mix of Marine Corps enlisted personnel. Assuming a goal of maximizing net benefit, high school graduates and nongraduates were evaluated in terms of both cost and performance differences. High school graduates cost more to recruit than nongraduates but have a lower attrition rate. In addition, there is abundant evidence that high school graduates perform better than nongraduates on the job. Educational requirements for new accessions were determined for several cost and relative-performance scenarios. (Author)

VIII. UNITED STATES NAVY

STUDY IDENTIFIER: NV67001

Plag, J. A., Goffman, J. M., & Phelan, J. D. (1967). The adaptation of Naval enlistees scoring in mental group 4 on the Armed Forces Qualification Test (AD-699-504). Alexandria, VA: Clearinghouse for Federal Scientific and Technical Information.

In summary, this report has presented findings from a study designed to evaluate differences in the adaptation of "average" and mentally marginal sailors during four years of military service. Sailors with AFQT scores of 50 are significantly superior to Category IV enlistees on military performance measures in which cognitive abilities play an essential role. While mental group IV sailors have appreciably lower rates of overall naval effectiveness, they do not differ significantly from average enlistees with respect to disciplinary and illness rates.

Four pre-enlistment characteristics were found to be valid for predicting four-year naval effectiveness among Category IV personnel. These four variables were years of schooling completed, number of school expulsions, AFQT score, and number of arrests. An actuarial table, showing the probability of naval effectiveness as a function of different combinations of these four predictors, was constructed as a guide for the use of recruiting officers in making decisions concerning the enlistment of mentally marginal applicants. (Author)

STUDY IDENTIFIER: NV67002

Plag, J. A., & Goffman, J. M. (1967). The Armed Forces Qualification Test: Its validity in predicting military effectiveness for Naval enlistees (AD 666 327). Personnel Psychology, 20(3), 323-329.

This study was designed to evaluate the individual and composite validities of the AFQT and a group of biographical variables for the prediction of military effectiveness among Naval enlistees. Five dichotomous measures of performance constituted the criteria, four being obtained two years after enlistment and one after four years of active duty. The four-year criterion represented an overall measure of military effectiveness, effective sailors being defined as those who completed their tours of active obligated duty with a recommendation for re-enlistment from their commanding officers.

AFQT score was found to be significantly related to all five criterion measures, but the magnitude of the relationships was small. On only one of the five criteria was AFQT score found to be the best of 14 predictors, and on some of the criteria it ranked only third to fifth in importance. The predictor which had a consistently high correlation with all of the criteria was level of educational achievement.

The results of this study suggest that AFQT score is not the best measure of an individual's potential for effective military performance and that a composite of variables would constitute a more valid measure for establishing standards for military acceptability and for evaluating the quality of manpower among the military services. (Author)

STUDY IDENTIFIER: NV70001

Thomas, P. J. (1970). _A comparison between the Armed Services Vocational Aptitude Battery (Form 1) and the Navy Basic Test Battery in predicting Navy school performance_ (Tech. Bulletin STB 70-4, AD-702 416). San Diego, CA: Navy Personnel and Training Research Laboratory.

The Armed Services Vocational Aptitude Battery (ASVAB) was developed by a joint-service technical group, using items from the services' previously operational tests. The ASVAB was designed as a potential replacement for the Armed Forces Qualification Test and the separate classification batteries used by each of the services. Thus, the effectiveness of the ASVAB in Navy classification needed to be determined and compared with the Basic Test Battery (BTB).

The ASVAB was administered to all recruits at two Naval training Centers and the men who subsequently attended a Navy Class "A" school were identified and their BTB scores and school grades obtained. The validities of the ASVAB and BTB tests were investigated within each school and linear-sum correlations were also computed to determine the best combinations of ASVAB tests as possible school selectors. A computerized item selection technique was applied to the tests in each battery. Various item statistics and validities and reliabilities for the shortened tests were obtained for use in evaluating Form 1 of the ASVAB and in development of subsequent forms.

Form 1 of the ASVAB was found to be too easy for effective discrimination among Navy students. Comparisons of the BTB and ASVAB validities uniformly favored the BTB. The linear-sum analysis of possible ASVAB classification composites revealed excessive dependence on the ASVAB Arithmetic Reasoning Test, making selection within a limited talent pool very difficult. It was recommended that: (1) subsequent forms of the ASVAB be made more difficult; (2) ASVAB validities for predicting school performance in the other services be determined; and (3) the effectiveness of the ASVAB for differential classification be improved. (Author)

STUDY IDENTIFIER: NV72001

Thomas, P. J. (1972). _An investigation of possible test bias in the Navy Basic Test Battery_ (TB-STB-73-1, AD-749 697). San Diego, CA: Navy Personnel and Training Research Laboratory.

PROBLEM AND BACKGROUND

This investigation was undertaken to determine if there is racial bias in the Navy Basic Test Battery (BTB), which is used to assign recruits to technical school training. If the BTB were found to be biased, the extent of bias and possible means for correcting its effects were to be determined.

APPROACH

BTB scores and Class "A" school grades were obtained for the approximately 105,000 whites and 2,000 blacks who attended "A" Schools in 1969 and 1970. The data used were taken from the 24 schools with the largest numbers of black students. Statistical analyses were conducted of the BTB scores and standardized school grades, including a comparison of the validities, by racial group, of the selection test composites actually used in the selection of students.

FINDINGS AND CONCLUSIONS

1. The black and white samples differed significantly in their performance on both the predictor tests and on the school grade criterion. The BTB mean differences ranged from .26 to .74 standard deviation units, while the average school grade difference was .36 standard deviation, with whites scoring higher than blacks on all variables (page 4).

2. The regression lines of each of the BTB tests were significantly different for blacks and whites. In practice, combinations of tests are used for school selection. If single tests were used, neither racial group would be consistently favored by the BTB. Overprediction of minority performance would be somewhat more common than underprediction (page 6).

3. The tests were more accurate in the prediction of the grades of white students than of black students. The selection composites were significantly valid predictors of the performance of white students in all schools and for black students in half of the schools (page 14).

RECOMMENDATIONS

1. No raising or lowering of test cutting scores for school selection of minority group members appears warranted (page 14).

2. Since the tests are not as valid for blacks as for whites, it is necessary to develop improved tests and/or use different combinations of existing tests. Such investigations are underway. In the meantime, implementation of ch .iges in the selection test combinations suggested in this report is recommended (page 14). (Author)

STUDY IDENTIFIER: NV75001
Thomas, P. J. (1975). Racial differences in the prediction of Class "N" schools (NPRDC-TR-75-39)1. San Diego, CA: Navy Personnel Research and Development Center.

This study is the latest in a series of efforts to provide the educationally disadvantaged with an opportunity for technical training in a Navy rating. Based on the findings of a 1972 study, which concluded that the Navy's selection tests are not as valid for minority personnel as they are for the majority group, the utility of alternative test composites was investigated. (Author)

STUDY IDENTIFIER: NV78001
Swanson, L. (1978). Armed Services Vocational Aptitude Battery, Forms 6 and 7: Validation against school performance: Interim report (NPRDC-TR-78-24, AD -A056 700). San Diego, CA: Navy Personnel Research and Development Center.

Two validation studies, one concurrent and one predictive, were conducted to evaluate the effectiveness of the Armed Services Vocational Aptitude Battery, used since January 1976 for acceptance of applicants into the Armed Services and for initial assignment to school after completion of recruit training.

ASVAB subtest and current selector composite validities against a final school grade (FSG) or days-in-training (DAYS) criterion were determined for each school sample. Validities of many other two-, three-, and four-test sets of ASVAB composites were also determined to discover more valid composites than those operationally used. In addition, in the predictive study, revised composites developed in a related study on Basic Electricity and Electronics (BE/E) courses were validated in several follow-on "A" schools. (Author)

STUDY IDENTIFIER: NV79001

Swanson, L. (1978). Armed Services Vocational Aptitude Battery, Forms 6 and 7: Validation against school performance in Navy enlisted schools (July 76 - February 78) (NPRDC-TR-80-1, AD-A077 158). San Diego, CA: Navy Personnel Research and Development Center.

This predictive validation study was conducted to evaluate the effectiveness of the Armed Services Vocational Aptitude Battery (ASVAB), Forms 6 and 7, used since January 1976 for acceptance of applicants into the Armed Services and for initial assignment to school after completion of recruit training. ASVAB subtest and current selector composite validities against a final school grade or days-in-training criterion were determined for each school sample. Validation of many other two-, three-, and four-test sets of ASVAB subtests were also determined in an attempt to discover more valid composites than those operationally used. Recommendations were made for changing selector composites in 10 schools to lower academic attrition. (Author)

STUDY IDENTIFIER: NV80001

Atwater, D. C., & Abrahams, N. M. (1980). Evaluation of alternate ASVAB composites for selected Navy technical schools (NPRDC-TR-80-15, AD-A081 744). San Diego, CA: Navy Personnel Research and Development Center.

The purpose of this study was to determine whether alternate selection test composites from the ASVAB could be used to reduce academic attrition in certain Navy technical schools. Students from schools studied were assigned to a test selection or a hold-out sample. Using multiple regression, the most valid test composites were identified for each school in the test selection sample and validated, along with the current selector composite, in the hold-out sample. Results indicated that using a new selection composite, 2MK + AR + GS, for BE/E for Aviation Support Equipment Technician would reduce attrition in that school and improve performance in the follow-on ASE "A" school. No other recommendations to change selection composites were made. (Author)

STUDY IDENTIFIER: NV80002

Mew, D. V. (1980). The prediction of performance in Navy Signalman Class "A" school (TEAG Report Number 90, AD A090 286). Orlando, FL: Training Analysis and Evaluation Group.

Navy enlisted personnel enrolled in the Signalman course were trained in sending and receiving Morse code using innovative training materials (Mnemonics and guided practice). Two aptitude groups (High and Average) were compared on code learning and performance factors. The ASVAB and non-verbal tests Visual Pattern Discrimination (VPD) and Visual Reaction Time (VRT) were used to predict performance. Mnemonics and guided practice

proved superior to traditional training materials for learning Morse code. The type of training materials had no significant effect on ability to send and receive messages. The ASVAB tests used to select signalmen for training were good predictors for High aptitude individuals while the VPD proved the best predictor for the lowest quartile (as measured by word knowledge (WK) and arithmetical reasoning (AR) ASVAB subtests). Course attrition was discussed and a training model proposed for Navy Signalman training. (Author)

STUDY IDENTIFIER: NV81001
Brown, C. J., Kincaid, P. J., & McMorrow, H. (1981). Assessment of numerical skills of Navy enlisted personnel. Orlando, FL: Navy Training Evaluation and Analysis Group.

The purpose of this study was twofold: to examine the extent of basic numerical skills deficiencies in the population of recruits bound for Apprentice Training and to examine whether selected Armed Services Vocational Aptitude Battery (ASVAB) test scores could be used to predict numerical skills performance.

This project was undertaken by the Training Analysis and evaluation Group (TAEG) and Academic Remedial Training (ART), Recruit Training Command, Orlando, as part of a larger project tasked by the Chief of Naval Education and Training in the area of improving basic academic skills.

Of 293 recruits bound for Apprentice Training, more than 100 failed to pass a basic test of Navy numerical skills. Deficiencies were in the area of application of math skills rather than in the basic numerical operations of addition, subtraction, multiplication, and division. When selected ASVAB scores were analyzed, an effective formula was derived to predict a numerical skills deficit. The ASVAB subtest score for Arithmetic Reasoning (AR), combined with Paragraph Comprehension (PC) and Numerical Operations (NO) scores, was found to be the best predictor. (Author)

STUDY IDENTIFIER: NV81002
Department of the Navy. (1981, September 3). Validation of ASVAB 6/7 selector composites for the Avionics Group (AV) and AE Class "A" school. (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

This "validation letter" provides validity information at subtest and composite levels for graduates, academic attritees and non-academic attritees for ten avionics training courses. Nine of the ten courses used contact hours as the criterion and one used final school grades. Both corrected and uncorrected coefficients are presented at the subtest and selector composite level. Expectancy tables are also provided. (Contractor)

STUDY IDENTIFIER: NV82002

Department of the Navy. (1982, February 22). <u>Validation of ASVAB Forms 6 and 7 against school performance in Cryptologic Technician (CT) "A" schools</u>. (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

High academic attrition rates in four Cryptologic Technician school courses prompted validation of ASVAB 6/7 and Radio Code Aptitude Test (RCAT). Criteria used were Final School Grades and Pass/Fail school criteria. Because of the different types of curricula used in the four Navy schools, separate analyses were conducted.

Results indicated that one of the most effective predictor composites was WK + AR. It was recommended for use in the fourth course as a selector composite (it was already being used in the other three courses) vice the Clerical Composite. Since the validities for the RCAT were lower than the WK + AR composite, it was recommended that its use be discontinued. (Contractor)

STUDY IDENTIFIER: NV82003

Swanson, L. (1982, March 29). <u>Validation of the Armed Services Vocational Aptitude Battery Forms 6 and 7 in Machinery Repairman Class "A" school</u> (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

The purpose of this study were: (1) to compare the effectiveness of the operational selector composite (WK + MC + SI) and various alternatives to identify the composite most effective for reducing drop rate at the school, and (2) to provide data for establishing a qualifying composite score for assignment to MR "A" school.

CONCLUSION

1. The current selector composite for MR "A" School was only moderately related to the FSG criterion ($ru = .28$, $rc = .33$).

2. Four alternative composites, about equally valid, had substantially higher validities than the operational composite for predicting FSG. Uncorrected r's range from .38 to .40, corrected r's ranged from .40 to .43.

3. The maximum uncorrected validity from all 12 ASVAB tests, obtained from a multiple correlational analysis, was .485. The multiple correlation involving the three most valid components, AR, MC and SI, was .461.

4. The math tests in ASVAB were the most predictive of Fsg in MR "A" School.

5. Fifteen percent of graduates, 29% of academic drops and 22% of non-academic drops of the sample in this study had wavered selector composite scores.

6. Only a slight increase in the percentage of academic drops was obtained with a cutting score lower than the operational one.

RECOMMENDATIONS

1. It is recommended that the AR+MC+SI composite be used for MR "A" School selection.

2. The cutting score should be determined by policy personnel on the basis of data in this report augmented by other information such as manning levels in the MR rating, the availability of qualified applicants, and whether school seats are being filled. (Author)

STUDY IDENTIFIER: NV82004

Herman, K. L., & Booth-Kewley, S. (1982). Validation of the Armed Services Vocational Aptitude Battery, Forms 6/7 and 8/9/10 in Interior Communications Electrician Class "A" school. Unpublished manuscript.

The purposes of the current study were (1) to examine the effectiveness of the operational ASVAB Composite (AR+2MK+GS) and various alternative composites for predicting student performance in IC "A" school and (2) to examine separately the effectiveness of various composites for the students in the four and six year obligor [sic] programs.

CONCLUSIONS AND RECOMMENDATIONS

1. The current selector composite for IC "A" school was found to be a good predictor of both FSG and Contact Time.

2. There were no significant differences between the multiple correlations for tests in the operational composite and the optimal composites.

3. It is recommended that the operational composite AR+2MK+GS be retained as the selector composite for IC "A" school. (Author)

STUDY IDENTIFIER: NV83003

Moreno, K., Wetzel, C. D., McBride, J. R., & Weiss, D. J. (1983). Relationship between corresponding Armed Services Vocational Aptitude Battery (ASVAB) and Computerized Adaptive Testing (CAT) subtests (NPRDC-TR-83-27, AD-A131 683). San Diego, CA: Navy Personnel Research and Development Center.

The relationship between selected subtests from the Armed Services Vocational Aptitude Battery (ASVAB) and corresponding subtests administered as computerized adaptive tests (CAT) was investigated using a sample of Marine recruits. Results showed that the CAT subtest scores correlated as well with initial ASVAB scores as did ASVAB retest scores, even though the CAT subtests contained only half the number of items. Factor analysis showed the CAT subtests loaded on the same factors as did the corresponding ASVAB subtests, indicating that the same mental abilities were being measured. The Armed Services Qualification Test (AFQT) composite was predicted equally well from either ASVAB or CAT administrations, even though the CAT contained only three of the four AFQT subtests. CAT requires fewer test items to perform the same task as the current paper-and-pencil ASVAB. (Author)

STUDY IDENTIFIER: NV83005

Wardlaw, W. E. (1983). Enlisted performance standards model for Operations Specialist rating (AD-A132 270). Unpublished master's thesis, Naval Postgraduate School, Monterey, CA.

This thesis describes the results of analyses investigating the selection of recruits entering the Navy for the Operations Specialist rate. Subsequent performance in that rating is predicted from pre-service education, results of pre-selection service aptitude tests, and marital status. Military enlistment files were used to describe the characteristics of non-prior service males entering the Navy. Selection standards for new recruits are developed based upon the relationships found between pre-enlistment characteristics and performance in the Navy. (Author)

STUDY IDENTIFIER: NV83006

Flyer, E., & Elster, R. (1983). First-term attrition among non-prior service enlisted personnel: Loss probabilities based on selected entry factors (NPS54-84-007, AD-A134 365). Monterey, CA: Naval Postgraduate School.

This report describes the results of analyses investigating the relationships between demographic information available for recruits at enlistment and attrition during the first three years of military service. Population studied consists of over two million male and female non-prior service accessions who enlisted during Fiscal Years 1973 through 1978. Attrition rates were determined for this population in respect to the following factors: Service; sex; race; educational level; age; marital status; AFQT; and home of record at enlistment. Interactions were also determined between many of these factors and attrition.

Each of the demographic factors was found to be related to service attrition. Prediction of attrition was increased, however, when interactions between these factors and attrition were taken into account. It should now be possible to develop Service-specific composite scores to predict attrition that are more effective than the combinations of educational level and AFQT scores currently employed in enlistment screening. (Author)

STUDY IDENTIFIER: NV83007

Houston, W. M., & Novick, M. R. (1983). Race-based differential prediction in Air Force technical training programs (Unpublished report). Brooks AFB, TX: Air Force Human Resources Laboratory.

Bayesian Johnson-Neyman methodology is used to investigate differential prediction by race in United States Air Force technical training programs. Meaningful Johnson-Neyman regions of differences were found in eight of nine comparisons. In all nine training courses the regressions for blacks were flatter than for whites and the black/white interaction was disordinal. In six cases the cut-score for course qualification was within the Johnson-Neyman region and in every case the bias was negative for blacks. It is also noted that if the cut-score has been set substantially higher the bias would have been positive for blacks in all cases. It is suggested that this analysis explains why earlier studies which averaged bias across the predictor distribution yielded mixed results. It is hypothesized that the consistent results obtained here are a consequence of the lower predictability found in the black subpopulation. (Author)

STUDY IDENTIFIER: NV84001

Booth-Kewley, S. (1984). <u>Validation of Armed Services Vocational Aptitude Battery (ASVAB) of and English Diagnostic Test (EDT) for performance in Basic Journalist (JO) 'A' school</u> (MPL-TN-84-3, AD-A146 882). San Diego, CA: Navy Personnel Research and Development Center.

This research evaluated the Armed Services Vocational Aptitude Battery (ASVAB) clerical composite which is used to determine qualification of Navy recruits for Basic Journalist (JO) "A" school. The research also evaluated the contribution of the English Diagnostic Test (EDT) to the ASVAB selection criteria. Correlational and expectancy analyses indicated that the ASVAB general technical composite predicts performance in JO school better than does the clerical composite. The EDT makes a small but significant contribution to the validity of the ASVAB general technical composite. (Author)

STUDY IDENTIFIER: NV84002

Oslund, D. A., & Clark, J. S. A. (1984). <u>Development of an enlistment standards model for the Navy Aviation Machinist's Mate (AD) rating</u> (AD-A152 127). Monterey, CA: Naval Postgraduate School.

The purpose of this study is to present analytic techniques for developing enlistment standards models which attempt to improve upon existing methods. Alternative criteria for measuring successful operational performance, and a means of measuring utility are also provided. Another purpose of this study is to discover if the Navy's system of selecting personnel for the Aviation Machinist's Mate (AD) rating may be improved.

Two criteria were utilized in developing these models--length of service, and a composite measure of success that considers length of service, highest pay grade achieved, and reenlistment eligibility. Measures on individuals at the time of enlistment are used as predictor and discriminating variables. Six models are developed and analyzed using regression and discriminant techniques. Utility analysis is conducted on each of these models as a means for measuring their usefulness in monetary terms. Recommendations for future research are also presented. (Author)

STUDY IDENTIFIER: NV84003

Cory, C. H., & Knudsen, L. P. (1984). <u>Technical classification and assessment center (TCAC) tests: Validity for predicting job achievement of general detail (GENDET) personnel</u> (NPRDC-TR-84-25, AD-A139 105). San Diego, CA: Navy Personnel Research and Development Center.

This research evaluated 24 predictors, including experimental tests administered in a technical classification assessment center (TCAC), biographical variables, and Armed Services Vocational Aptitude Battery (ASVAB) tests, for classifying personnel for general detail (GENDET) billets in the Navy. Enlisted history data were extracted for 991 GENDETs who had taken the TCAC tests. Major criteria included supervisors' marks and job history variables. Predictor validation was carried out using multiple regression with a double cross-validation paradigm. The TCAC tests added to the predictiveness of ASVAB and biographical variables for supervisors' marks, but all of the job history criteria were better predicted by combinations of ASVAB , biographical, and TCAC variables. Because this and other research shows that job history variables are much better criteria of job performance than are supervisors' marks, further research with TCAC tests for selecting GENDETs is not warranted. (Author)

STUDY IDENTIFIER: NV84005

Booth-Kewley, S., Foley, P. P., & Swanson, L. (1984). Predictive validation of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, 10 against 100 Navy schools (NPRDC-TR-85-15, AD-A149 695) San Diego, CA: Navy Personnel Research and Development Center.

This predictive validation study was conducted to examine the effectiveness of Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, and 10, used since October 1980 for selection and classification of enlisted personnel. Bivariate and multiple correlation coefficients between the ASVAB predictors--individual tests, the Armed Forces Qualification Test (AFQT), and the Navy school selector composites--were computed for 47 "A" and 53 Basic Electricity and Electronics (BE/E) school samples. Expectancy tables were constructed for the 54 schools with sufficient data. In general, the operational Navy composites predicted technical school performance reasonably well. However, the analyses identified two schools for which a change in composite would substantially improve prediction of school performance. (Author)

STUDY IDENTIFIER: NV84006

Booth-Kewley, S. (1984). Validation of the Armed Services Vocational Aptitude Battery (ASVAB) selection criteria for strategic weapons systems Electronics "A" school (NPRDC-TR-84-22). San Diego, CA: Navy Personnel Research and Development Center.

This predictive validation study was conducted to evaluate the effectiveness of the operational Armed Services Vocational Aptitude Battery (ASVAB) selector composite against Strategic Weapons Systems Electronics (SWSE) "A" School performance and to investigate the possible use of alternative ASVAB composites to reduce attrition in this school. Bivariate and multiple correlations between ASVAB predictors and three school performance criteria were computed and compared. The current ASVAB selector composite was found to be the best predictor of performance in SWSE "A" School. It was recommended that the selector composite be retained, but that careful consideration be given to the possibility of raising the cutting score(s). (Author)

STUDY IDENTIFIER: NV84007

Booth-Kewley, S. (1984). Validation of Armed Services Vocational Aptitude Battery (ASVAB) in Cryptologic Technician Technical (CTT) "A" School (MPL-TN-84-1). San Diego, CA: Navy Personnel Research and Development Center.

PROBLEM

The Armed Services Vocational Aptitude Battery (ASVAB) is used in the selection and initial assignment of recruits to Navy schools or on-the-job training. ASVAB Forms 8,9, and 10, which became operational in October 1980, have not yet been validated for any for the cryptologic technician "A" schools.

OBJECTIVE

The objective of the current study was to examine the effectiveness of the operational ASVAB selector composite (VE + AR) and alternate composites for predicting performance in Cryptologic Technician Technical (CTT) "A" school.

APPROACH

The sample consisted of 134 students who attended the CTT "A" school at Pensacola, Florida, between July 1982 and June 1983. Sample sizes used for various analyses fluctuated widely because of missing data.

Pearson product-moment correlations between the predictors--ASVAB tests, ASVAB composites, and the Radio Code Aptitude Test (RCAT)--and the criteria were computed and corrected for range restriction. Final school grade (FSG) was the primary criterion of school performance. Additional performance criteria consisted of days to graduate (DAYS), final status code (FINSTAT--designated whether the student graduated from or dropped the course), the number of times the student was seen by a preventative counselor (TSBPC), and the number of times the student was assigned remediation (TAR). Scores on nine class-administered tests were supplementary criterion measures. Multiple correlations between ASVAB tests and each criterion were calculated using a stepwise regression procedure.

Expectancy tables were constructed for the operational composite, as well as for some alternate composites that appeared promising.

RESULTS

The operational selector composite is a fairly good predictor of FSG, but a poor predictor of DAYS, FINSTAT, TSBPC, and TAR. However, for each criterion except TAR, none of the ASVAB predictors is significantly more valid than VE + AR, the operational composite. It is only moderately predictive of scores on the nine class-administered tests.

RCAT has a high correlation with FSG, but this result is based on a small sample size and should probably be regarded as spurious. In addition, RCAT has low correlations with the other criteria.

A comparison of expectancy analyses results for the operational composite and three other promising experimental composites revealed that using alternate composites results in nearly the same rate of students dropped for academic reasons (27%-30%) as occurs with VE + AR (29%).

CONCLUSION AND RECOMMENDATION

The correlational and expectancy analyses indicated that changing the CTT selector composite would not reduce academic attrition. Therefore, the operational CTT composite (VE + AR = 97) should be retained as the ASVAB selector composite for CTT "A" school. (Author)

STUDY IDENTIFIER: NV84008
Booth-Kewley, S. (1984). Validation of Armed Services Vocational Aptitude Battery (ASVAB) selection criteria for Crytologic Technician Collection (CTR) "A" School (MPL-TN-84-2). San Diego, CA: Navy Personnel Research and Development Center.

PROBLEM

The Armed Services Vocational Aptitude Battery (ASVAB) is used in the selection and initial assignment of recruits to Navy schools or on-the-job training. ASVAB Forms 8, 9, and 10, which became operational in October 1980, need to be validated for Cryptologic Technician

Collection (CTR) Class "A" school (CDP 6301) to maintain effective standards for school selection. Furthermore, the academic attrition rate at the CTR "A" school is high, exceeding 25 percent in recent studies. The validity of the current ASVAB selection criteria for the school and the possible use of different selection criteria need to be examined in terms of school performance as well as attrition.

OBJECTIVES

The objectives of this research were to (1) examine the effectiveness of the operational CTR "A" school ASVAB selector composite (VE + AR = 97) for predicting school performance and attrition, and (2) identify alternate ASVAB composites or other measures that may be more effective than the operational composite for predicting school performance and attrition.

METHOD

The sample consisted of 148 students who attended the CTR "A" school at Pensacola, Florida, between July 1982 and June 1983. Due to missing data, sample sizes used for various analyses fluctuated widely.

The predictor variables were the ASVAB tests, ASVAB composites, and the Radio Code Aptitude Test (RCAT). Final school grade (FSG), days to graduate (DAYS), times seen by preventative counselor (TSBPC), times assigned remediation (TAR), and final status (FINSTAT) were used as criteria. Scores on 13 class-administered tests were supplementary criterion measures.

Pearson product-moment correlations were computed and corrected for range restriction. Multiple correlations between ASVAB tests and each of the five main criteria were calculated using a stepwise regression procedure. Expectancy tables were constructed for the operational, as well as for some alternate composites that appeared promising.

RESULTS

The operational selector composite was the best over all predictor of school performance. For each of the five main criteria, as well as for the 13 unit test scores, none of the ASVAB predictors was found to be significantly more valid than the operational one. RCAT was a poor predictor of FSG, a fair predictor of DAYS, TSBPC, and TAR, and a good predictor of FINSTAT.

A comparison of expectancy analysis results for the operational composite and two experimental composites revealed that use of either of the alternate would result in about the same academic drop rate (27%-29%) as now occurs.

CONCLUSIONS AND RECOMMENDATIONS

The correlational and expectancy analysis results indicated that changing the CTR selector composite would not reduce academic attrition. Other possible explanations or remedies for the attrition may be more pertinent. Therefore, the operational CTR composite (VE + AR = 97) should be retained as the ASVAB selector composite for CTR "A" school and other possible explanations for the school's high attrition rate should be investigated. (Author)

STUDY IDENTIFIER: NV84009

Wiskoff, M. F. (1984, June 14). Validation of the ASVAB selection criteria for GMG, GMM, and GMT (ASROC) Class "A" schools (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

The purpose of this brief validation study was to establish the relationship between performance on the ASVAB electronics composite and school performance in three Navy Class "A" schools. Validity coefficients were computed on 11 composites for two types of criteria, pass/fail in phase one of the GMG, GMM, and GMT school and final school grades for the phase two of the same three schools. Expectancy tables were developed and presented for the Basic Electronics school only because of the small number of attritees for the more advanced course. (Contractor)

STUDY IDENTIFIER: NV84010

Department of the Navy. (1984). Validation of the ASVAB selection criteria for ABE, ABF, and ABH Class "A" schools (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

The purpose of this short validation study was to examine the predictive effectiveness of two composites of the ASVAB for three Navy Class "A" school performance measures (ABE, ABF and ABH ratings). Expectancy tables, showing expected performance and attrition rates were developed. Since the existing attrition rates were low, direct relationship between composite cut scores and failure rates could not be established. Instead, distributions of scores for both composites were used to estimate percentages of recruits at various score levels. (Contractor)

STUDY IDENTIFIER: NV84011

Curtis, J. S., Booth-Kewley, S., & Swanson, L. (1984). Validation of the Armed Services Vocational Aptitude Battery (ASVAB) Forms 8, 9, and 10 in two Hull Maintenance Technician Class "A" Schools (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

PROBLEM

Selection and initial assignment of recruits to "A" school is based upon scores obtained on the Armed Services Vocational Aptitude Battery (ASVAB), forms 8, 9, and 10. Validation of these scores for Hull Maintenance Technician "A" school's present curriculum, which was revised in the summer of 1982, was sought. Such validation is necessary to maintain effective school selection standards.

OBJECTIVE

The objectives of this research were to (1) validate the operational ASVAB composite against HT "A" school performance and (2) identify and evaluate alternative ASVAB composites that may be more effective for determining qualification for school assignment.

APPROACH

Data analyses were performed separately for HT students in each of the two Hull Technician schools, Philadelphia (N = 436) and San Francisco (N = 502) with scores on ASVAB 8, 9, and

96

10. The predictor variables were the ASVAB tests and selector composites. The criterion variables consisted of final school grade (FSG) and days to graduate (DAYS). Pearson product-moment correlations of ASVAB predictors with FSG and DAYS were computed and corrected for restrictions in range. The validity coefficients of the Navy ASVAB composites in current use were compared to the validity coefficients of the operational HT "A" school composite. Multiple correlations were also computed and compared with the uncorrected operational composite validities, using the four to six ASVAB tests that accounted for the most variance.

RESULTS

The operational selector composite was found to be a good predictor of the school performance criteria. No composites were identified that were more valid than the operational composite for predicting both criterion measures. However, four composites were found to be significantly more valid at predicting FSG for the San Francisco HT school.

CONCLUSIONS

The current ASVAB selector composite of HT "A" school(VE+MC+AS) is the most useful for selecting students.

RECOMMENDATIONS

1. The operational ASVAB selector composite should be retained by the HT "A" schools.

2. Consideration should be made to standardizing the grading method for the two schools; it is administratively impossible to have two separate selector composites. (Author)

STUDY IDENTIFIER: NV85001
Booth-Kewley, S. (1985). An empirical comparison of the accuracy of univariate and multivariate corrections for range restrictions (NPRDC-TR-85-19, AD-A153 0171). San Diego, CA: Navy Personnel Research and Development Center.

A study was conducted to determine whether uncorrected validity coefficients, those corrected for univariate range restriction, or those corrected for multivariate range restriction would be the most accurate in estimating the unrestricted population validity coefficients, and hence the most appropriate for use in Navy personnel selection research. Correlations were computed between scores on Armed Services Vocational Aptitude Battery (ASVAB) predictors--ASVAB tests and school selector composites--and student performance scores for seven Navy technical schools with numbers of students ranging from 880 to 2598. These correlations were regarded as "true" validity coefficients and each school was regarded as a population. Restricted samples were selected from each "population." Validity coefficients were computed for each restricted sample; these values were corrected using a univariate and multivariate correction procedure. Validity coefficients that were corrected using the multivariate procedure were generally more accurate than those corrected using the univariate procedure, and univariate corrected validity coefficients were more accurate than uncorrected validity coefficients. (Author)

STUDY IDENTIFIER: NV85002
Booth-Kewley, S., & Swanson, L. (1985). <u>Distribution of Armed Forces Qualification Test</u>
<u>(AFQT) scores across Navy technical schools</u> (MPL-TN-85-3). San Diego, CA: Navy
Personnel Research and Development Center.

The objectives of this research were to (1) examine and describe the distribution of AFQT
and ASVAB school selector composite scores across a wide variety of Navy technical
schools, and (2) compare attrition rates and percentages of enrolled students who have not
met the cut off scores on the ASVAB school selector composites.

RESULTS AND CONCLUSIONS

1. Mean AFQT scores and the portions of the AFQT score ranges falling between the 10th
   and 90th percentiles varied substantially across technical schools. This finding might be
   expected, given the disparate ASVAB selection criteria used by the schools and the
   correlations between the AFQT and the ASVAB school selector composites.

2. Mean AFQT scores and AFQT score ranges for schools with the same ASVAB selection
   criteria were fairly similar, which might also be expected, given the high correlations
   between the AFQT and the ASVAB school selector composites. Not surprisingly, the
   ASVAB selector composite means for the schools using the same selection criteria were
   also similar.

3. Most of the school samples used in the study included some students who did not meet
   the cutting scores on the ASVAB school selector composites. This percentage was
   small, 4 percent or less, for 70 of the 100 schools. There were, however, 13 schools
   for which this percentage was rather large, ranging from 13 to 55 percent. This finding
   appeared to be due to (1) changes in the ASVAB selection criteria for these schools (2)
   involvement of the schools in the JOBS programs, and (3) waivers granted to permit
   enlistees scoring below the ASVAB school selection criteria to attend the schools.

4. Overall attrition for the "A" schools was low; the mean for the 47 schools was 4
   percent; only one school had an attrition rate of 20 percent or higher. In contrast,
   overall attrition for the BE/E schools was high; the mean for the 53 schools was 16
   percent, and 17 of the schools had attrition rates of 20 percent or higher. These results
   are not surprising because most "A" school students have already attended BE/E school,
   where the less able and less motivated students are dropped from the training pipeline.
   (Author)

STUDY IDENTIFIER: NV85003
Pass, J. J. <u>Validation of the ASVAB selection criteria for the QM Class "A" school</u>. (NPRDC
LTR). Undated. San Diego, CA: Navy Personnel Research and Development Center. .

The objectives of this research were to (1) validate the operational ASVAB composite and
the individual ASVAB subtests against QM "A" school performance, (2) address issues
raised by the schools (the consequences of low AR scores), and (3) identify and evaluate
alternative ASVAB composites that may be more effective for determining qualifications for
school assignment.

CONCLUSIONS AND RECOMMENDATIONS

Research results indicate a change in selector composites is not needed. Other things being equal, raising the qualifying score from 98 to 106 on the current selector composite would reduce the percentage drops from 14 percent to 5 percent. Raising the qualifying score cannot be recommended, however, unless the Military Personnel Command (NMPC-48) can demonstrate: a) there are enough Navy applicants with scores of 106 and greater to meet this requirement as well as the competing requirements with other Class "A" schools, and b) there are no adverse consequences such as shortage of QMs in the fleet and vacant QM Class "A" school seats. (Author)

STUDY IDENTIFIER: NV86001

Foley, P. P. (1986). Validity generalization of Navy selector composites (NPRDC-TR-86-17, AD-A168 363). San Diego, CA: Navy Personnel Research and Development Center.

Validation of the Armed Services Vocational Aptitude Battery (ASVAB) has been considered necessary for each Class "A" school and with introduction of each new ASVAB form. Scientific literature has presented evidence that variability in observed validity coefficients across studies may be attributable to a number of factors and the need for revalidation of the ASVAB may be unnecessary. If validity coefficients could be generalized from one Navy Class A school to a number of related schools, the Navy could save substantial costs in revalidating the ASVAB.

Results obtained from three sets of analyses confirmed the generalizability of validity coefficients across a wide range of Class A schools for each of the four selector composites investigated. The results will be used to estimate validity coefficients of the ASVAB in the future thus eliminating the cost of a new study. Validity generalization results obtained were comparable to those reported in the literature for similar studies. (Author)

STUDY IDENTIFIER: NV86002

Wiskoff, M. F. (1986, Jul 1). Validation of the ASVAB selection criteria for the IM and OM Class "A" schools (NPRDC LTR). San Diego, CA: Navy Personnel Research and Development Center.

The objectives of this research were to (1) validate the operational ASVAB Composite and the individual ASVAB subtests against IM and OM "A" school performance, and (2) address the issues raised by the schools (the consequences of low MK scores and the replacement of AS with GS).

CONCLUSIONS AND RECOMMENDATIONS

Although MK is a highly significant predictor of attrition in both IM and OM schools, the use of a minimum qualifying MK score of 50 would probably not be cost effective because a large proportion of potential graduates would be eliminated from school selection. The most valid and administratively feasible composite for selection to IM and OM schools would appear to be WK+PC+MK+GS. This composite is one of the Navy's existing selector composites and has the highest validity of all composites examined in this study. It also

resulted in a slightly higher success rate among selectees when the selection ratio matched that of the operational composite. In addition, it includes both MK, so that mathematics knowledge would carry some weight in selection, and GS, which was felt to be an important indicator of success in these schools.

Nevertheless, a recommendation to change selector composites for these schools cannot be made at this time. Because the sample sizes are so small and so subject to selection effects, the apparent slight superiority of WK + PC + MK + GS over the current operational composite may be simply due to chance.

Although conclusions regarding the superiority of wk + PC + MK + GS must remain tentative at this time, it might be feasible to use this composite on a trial basis with a minimum qualifying score of 165. Implementation on a trial basis will allow time to gather evidence as to whether it meets the needs of the IM and OM schools without adverse impact on other Navy requirements. (Author)

STUDY IDENTIFIER: NV87001
Schmidt, F. L., Hunter, J. E., & Dunn, W. L. (1987). Potential increases from adding new tests to the Armed Services Vocational Aptitude Battery (ASVAB) (NPRDC-DO-0053). San Diego, CA: Navy Personnel Research and Development Center.

This research examined whether the validity and classification utility of the ASVAB could be increased by adding additional predictors. The relevant literature indicated that ASVAB validity could be augmented by adding measures of (a) perceptual ability (to increase the validity of the ASVAB measurement of general mental ability) and (b) psychomotor ability. Adding perceptual ability increased the classification utility of the ASVAB by about 3%; the dollar value of this percentage increase increases over years of use of the augmented ASVAB, eventually building up to approximately $83 million per year. Adding both perceptual and psychomotor ability to ASVAB increased classification utility by approximately 5%. The eventual asymptotic value of this increase is $138 million per year. Augmenting the ASVAB produced unequal performance increases for more vs. less complex jobs; this fact may be an importance to Navy policy formulation. (Author)

AUTHOR INDEX

ABRAHAMS, N. M.
  NV80001

ALLEY, W. E.
  AF68001
  AF70001
  AF76003
  AF80001
  AF83002
  AF84002
  AF84003
  AF88002

ANDBERG, M. A.
  AF88004

ARMOR, D. J.
  AR82002

ARMSTRONG, T. R.
  AF88001

ATWATER, D. C.
  NV80001

BARNES, J. D.
  CV88004

BATCHELOR, C. L.
  AF87001

BERBERICH, G. L.
  AF76003

BERGER, F. R.
  AS82002

BERGER, R. M.
  AS82002

BERS, K.
  AR82002

BLACK, B. A.
  AR80002
  AR82005

BLACK, D. E.
  AF88002

BOCK, R. D.
  AR84003
  AS81002
  AS84008
  CV85003

BOOTH-KEWLEY, S.
  NV82004
  NV84001
  NV84005
  NV84006
  NV84007
  NV84008
  NV84011
  NV85001
  NV85002

BRANDT, D. A.
  AR84001
  AR84002
  AR84006
  AR84007

BROWN, C. J.
  NV81001

BROWN, D. C.
  CV88004

BUDDIN, R.
  CV84004

CAMARA, W. J.
  CV87003

CAMPBELL, C. H.
  AR82005

CAYLOR, J. H.
  CV71001

CAYLOR, J. S.
  CV69001
  CV82001

CHALUPSKY, A. B.
  AF88001

CLARK, J. S. A.
  NV84002

CORY, C. H.
NV84003

CROLL, P. R.
AF73001

CROSSON, J. J.
AF85002
AF86002

CURIA M. D.
MC86001

CURRAN, L. T.
AF87001

CURTIS, J. S.
NV84011

CUTLER, L. E.
AR82002

DALDORF, M. R.
AF88001

DAVIDSON, M. K.
AS82005

DEPARTMENT OF DEFENSE
AS84002
AS84009

DEPARTMENT OF THE NAVY
NV81002
NV82002
NV84010

DIEHL, G. E.
CV81002

DIRMEYER, R. P.
AS82005

DUNLAP, W. P.
AR82006
AR83002

DUNN, W. L.
NV87001

DUNNETTE, M. D.
AR84004

EARLES, J. A.
AF79001
AF81001

EATON, N. K.
AR80002

EDDY, A. S.
CV88002

EITELBERG, M. J.
AS84001

ELSTER, R.
NV83006

FERNANDEZ, R. L.
AR82002
CV84002

FINSTUEN, K.
AF83002

FISCHL, M. A.
AR79002
AR80001
AR81002

FLEISHMAN, E. A.
AF87004

FLETCHER, J.
AF76007

FLYER, E. S.
CV87006
NV83006

FOLEY, P. P.
CV88004
NV84005
NV86001

FOLEY, P. R.
CV86001

FOX, W. L.
CV69001

FRANKFELT, E.
AR70001

FREY, R. L.
CG81001

FRIEDMAN, D. H.
    AF85002
    AF86002
    AR83004

FUCHS, E. F.
    AR69001
    AR72001
    AR74001
    AR78001

GARFINKLE, J. B.
    CV84002

GIBBONS, R.
    CV85003

GOFFMAN, J. M.
    NV67001
    NV67002

GRAFTON, F. C.
    AR81001
    AR82003
    AR83004
    AR85001

GRISSMER, D. W.
    AS85002

GRUNZKE, M. E.
    AF70002

GUINN, N.
    AF70001
    AF70002
    AF76005
    AF77005
    AF77006
    AF77007

GUPTA, W. B.
    AS82002

HAHN, C. P.
    AF77008

HANSER, L. M.
    AR81004

HARDING, F. D.
    AF87004

HARRIS, D. A.
    AF76002

HARRIS, R. K.
    AF74002

HARTKE, D. D.
    AF88005

HASTINGS, C. N.
    AF88003

HAWLEY, J. K.
    AF77004

HEISEY, J. G.
    CV85002

HERMAN, K. L.
    NV82004

HIATT, C. M.
    MC81001
    MC82002
    MC84002

HOOKE, L. R.
    CV82001

HORNE, D. K.
    AR85001

HORNE, G. E.
    MC86002

HOUGH, L.
    AR84004

HOUSTON, J.
    AR84004

HOUSTON, W. M.
    NV83007

HU, P. G.
    AF88003

HUCKELL, R. K.
    AF74002

HUNTER, D. R.
    AF87001

HUNTER, J. E.
AF85002
CV80002
CV84001
NV87001

JENSEN, H. E.
AF76001
AF76006

JOHNSON, J.
AR80002

JONES, G. E.
CV88001

JONES, M. B.
AR82006
AR83002

KANTOR, J. E.
AF77006

KASS, R. A.
AR82003

KENNEDY, R. S.
AR82006
AR83002

KETTNER, N.
AF76004

KINCAID, P. J.
NV81001

KIRBY, S. N.
AS85002

KNOUSE, S. B.
AF74001

KNUDSEN, L. P.
NV84003

LAURENCE, J. H.
AS84001
AS88001
AS88002
CV84003
CV85002
CV87003

LEE, R.
CV86001

LEISEY, S. A.
AF76005
AF77005

LINN, R. L.
AF88003

LOCKMAN, R. F.
MC74001
MC81003

MAIER, M. H.
AR69001
AR72001
AR74001
AR78001
AR81001
MC82001
MC83001
MC83002
MC84001
MC84002
MC85001
MC85002
MC86001
MC86005

MARCUS, A. J.
MC81003

MARION, R.
AF72001

MARTIN, C. J.
AR83001

MASSEY, I. H.
AF76006

MASSEY, R. H.
AF82003

MATHEWS, J. J.
AF77003
AF77010
AF78001
AF82001
AF82003
AF85001

MAY, L. J.
  MC86006

MCBRIDE, J. R.
  AR79002
  NV83003

MCCORMICK, B. K.
  AR82006
  AR83002

MCGREVEY, D. F.
  AF74001

MCLAUGHLIN, D. H.
  AF88001
  AR84001
  AR84005
  AR84006
  AR84007

MCMORROW, H.
  NV81001

MCNAUGHT, W.
  CV80001

MEANS, B.
  AS82005
  CV84003
  CV85002
  CV87004

MESSERSMITH, D.
  AF86002

MEW, D. V.
  NV80002

MIFFLIN, T. L.
  MC78001

MISLEVY, R. J.
  AR84003
  AS81002

MITCHELL, K. J.
  AR82003
  AR83004

MOORE, E. G.
  AS84008

MOORE, S. C.
  AR82002

MORENO, K.
  NV83003

MULLINS, C. J.
  AF73001
  AF75001
  AF77004
  AF79001
  AF81001
  AF82003

MUMFORD, M. D.
  AF87004

MURAKI, E.
  CV85003

NOVICK, M. R.
  NV83007

OFFICE OF THE ASSISTANT
SECRETARY OF DEFENSE (FORCE
MANAGEMENT AND PERSONNEL)
  AS69001
  AS80002
  AS82001
  AS82003
  AS82004
  AS83001
  AS83002
  AS84003
  AS85003
  AS86002
  AS87001
  AS89001

OSLUND, D. A.
  NV84002

PALMER, P.
  AF88005

PARK, R. K.
  AF85001

PASS, J. J.
  NV85003

PEARLMAN, K.
  CV80002

PERELMAN, L. S.
    AS84001

PETERSON, N. G.
    AR84004

PHELAN, J. D.
    NV67001

PLAG, J. A.
    NV67001
    NV67002

POPELKA, B. A.
    AR81004
    AR83003

PREDIGER, D. J.
    CV87001
    CV87002

PRESTWOOD, J. S.
    AF85003
    AF88004

RAMSBERGER, P. F.
    CV87004

REE, M. J.
    AF76007
    AF81001
    AF82001
    AF82003
    AF84001
    AF85001
    AF86001
    AF88005

ROSENTHAL, D. B.
    AS88002

ROSS, R. M.
    AR79002
    AR80001

ROSSMEISSL, P. G.
    AR83001
    AR83005
    AR83006
    AR84001
    AR84002
    AR84006
    AR84007

RYAN, K. E.
    AF88003

SCHMIDT, F. L.
    CV80002
    NV87001

SCHWARZBACH, D. S.
    AR82002

SELLMAN, W. S.
    AF78001

SHIELDS, J. L.
    AR81004

SHORE, C. W.
    AF72001

SIEGEL, A. I.
    CV77001

SIMS, W. H.
    MC78001
    MC78002
    MC78003
    MC81001
    MC82002
    MC86005

SKINNER, M. J.
    AF80001
    AF84002
    AF84003

STAUFFER, G.
    AF70002

STEINHAUS, S. D.
    CV88004

STERMER, N. S.
    CV88003

STERN, B. M.
    AR83006

STICHT, T. G.
    CV71001
    CV82001

STILLWELL, W. G.
    AF88004

STOKER, P.
   AF87001

STOLOFF, P. H.
   MC83004

STREICHER, A.
   AF86002
   AR83004

SWANSON, L.
   NV78001
   NV79001
   NV82003
   NV84005
   NV84011
   NV85002

SYMPSON, J. B.
   AF82002

TAYLOR, E. N.
   CV71001
   CV72001

TAYLOR, J. E.
   CV69001

THOMAS, P. J.
   NV70001
   NV72001
   NV75001

THOMPSON, R. A.
   AF74001

TREAT, B. R.
   AF88002

TRUSS, A. R.
   MC82002
   MC83001
   MC84001
   MC85002

TUPES, E. C.
   AF70001

VALE, C. D.
   AF85003

VALENTINE, L. D., JR.
   AF76001
   AF76006
   AF77001
   AF77010
   AF78001
   AF84001
   AF88005

VINEBERG, R.
   CV71001
   CV72001

VITOLA, B. M.
   AF68001
   AF73001
   AF75001
   AF77007

WAGNER, M. P.
   AS82005

WANG, M.
   AR84001

WARDLAW, W. E.
   NV83005

WATERS, B. K.
   AS84001
   CV88004

WEEKS, J. L.
   AF75001
   AF77004

WEGNER, T. G.
   AF86001

WEISEN, J. P.
   CV77001

WEISS, D. J.
   AF82002
   NV83003

WELSH, J. R., JR.
   AF88004
   AF88005

WELTIN, M. M.
   AR83003

WETZEL, C. D.
    NV83003

WILBOURN, J. M.
    AF76003
    AF76005
    AF77006
    AF77007
    AF79001
    AF84001

WILEY, L. N.
    AF77008

WILLIAMS, E. W.
    AR81004

WING, H.
    AR82003
    AR83001
    AR83004
    AR84004

WISE, L. L.
    AR83005
    AR84001
    AR84006
    AR84007

WISKOFF, M. F.
    NV84009
    NV86002

SUBJECT INDEX

ADAPTIVE TESTING (see TESTS, ADAPTIVE)

ADVANCED INSTRUCTIONAL SYSTEM (AIS)
AF76002

AIR FORCE ENTRANCE EXAMINATION STATION (AFEES)
AF74001
AF76006
AR70001
AR74001
MC78003

ARMED FORCES QUALIFICATION TEST (AFQT) (see COMPOSITES, AFQT)

AIR FORCE SPECIALTY CODE
AF77008
AF87001

AIRMAN CLASSIFICATION BATTERIES (ACB)

AIRMAN QUALIFYING EXAMINATION (AQE)
AF68001
AF70001
AF70002
AF72001
AF73001
AF74001
AF75001
AF76002

ALL VOLUNTEER FORCE
AF77007
AR74001
AS84009
CV80001
CV84003
CV87006
MC74001
MC81003
MC86006
NV83005

ALLOCATION
AR69001

ALTERNATE FORMS RELIABILITY (see RELIABILITY, ALTERNATE FORMS)

ALTERNATIVE ARMED FORCES QUALIFICATION TESTS (see COMPOSITES,
                                                    AFQT; ALTERNATIVE)

APPRAISAL OF READING VERSATILITY (see LITERACY)
    AF77005

APTITUDE (see COMPOSITES, APTITUDE)

ARMY CLASSIFICATION BATTERY (ACB)
    AR69001
    AR72001
    AR78001
    CV69001

ARMY CLASSIFICATION INVENTORY (ACI)
    AF76006

ARMY CLERICAL SPEED TEST
    AR70001

ARMY QUALIFICATION BATTERY (AQB)
    AR70001

ARMY TRAINING TEST
    CV69001

ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB)
    FORM 1
        AF73001
    FORM 2
        AF76007
    FORM 3
        AF75001
    FORM 4
    FORM 5
        AF76007
        AF76006
        AF85002
        AR79002
        AS84002
    FORM 6
        AF85002
        MC78001
        MC78002
        MC78003
        MC82002
        NV78001
        NV79001
        NV82004

ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) (Continued)
    FORM 7
        AF85002
        MC78001
        MC78002
        MC78003
        MC82002
        NV78001
        NV79001
        NV82004
ASVAB (Continued)
    FORM 8
        AF85002
        AR84001
        AS80002
        AS84009
        MC82002
        MC83002
        NV83007
        NV84001
        NV84005
        NV84008
        NV84010
    FORM 9
        AF85002
        AR84001
        AS84009
        MC82002
        MC83002
        NV83007
        NV84001
        NV84005
    FORM 10
        AF85002
        AR84001
        AS84009
        MC82002
        MC83002
        NV83007
        NV84001
        NV84005
    FORM 11
        AS84009
        MC82001
    FORM 12
        AS84009
        MC82001
    FORM 13
        AS84009
        MC82001

ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) (Continued)
   FORM 14
        AF86002
        AS84002
        AS84009
        CV87001
        CV87002
        MC82001
        MC84001

ASVAB SELECTOR COMPOSITES (see COMPOSITES, ASVAB)

ASVAB SUBTESTS (see SUBTEST, VALIDITY)

ASVAB MISNORMING (see NORMING)

ATTRITION
        AF77005
        AF77006
        AF80001
        AF83002
        AF84002
        AF84003
        AF87001
        AF87004
        AR72001
        AR81004
        AR83005
        AS69001
        AS82005
        AS83002
        AS85002
        AS88001
        AS88002
        CV84002
        CV84003
        CV84004
        CV87004
        CV87006
        NV80001
        NV80002
        NV82003
        NV83006
        NV84001
        NV84006
        NV85002
        NV85003
        NV86002

AUDING
        CV82001

BASIC ACADEMIC SKILLS
    NV81002

BASIC TEST BATTERY (BTB)
    NV86001
    NV78001
    NV72001

BASIC TRAINING (see TRAINING, TECHNICAL)

BAYESIAN STATISTICS
    BAYESIAN ESTIMATION
    BAYESIAN ADAPTIVE TEST
        AF82002
        AF85002
        CV80002
        NV83003

BIOGRAPHICAL VARIABLES
    NV84003

CALIBRATION (see also EQUATING)
    AS80002

CATEGORY I-IV (see COMPOSITE, AFQT CATEGORIES)

CIVILIAN POPULATION (see REFERENCE GROUP, 1980 AMERICAN YOUTH)

CLASSIFICATION
    MILITARY OCCUPATIONS
        ASSIGNMENT
            AF75001
            AF76002
            AF76005
            AF77006
            AF81001
            AF82002
            AF86001
            AR69001
            AR72001
            AR78001
            AR80002
            AR81001
            AR82003
            AR82005
            AR83002
            AR83006
            AR84001
            AR84002
            AR84004
            AR84005
            AR84007
            AR85001
            AS84001

CLASSIFICATION
   MILITARY OCCUPATIONS
      ASSIGNMENT (Continued)
         AS85002
         AS85003
         AS86002
         CG81001
         CV82001
         MC74001
         MC81003
         MC82001
         MC83001
         MC84002
         MC86001
         NV70001
         NV75001
         NV84001
         NV84003
         NV85002

   CIVILIAN OCCUPATIONS
      AF88001
      MC84001
   COUNSELING/EXPLORATION
      AF76001
      AF76003
      AF80001
      AF84002
      AF84003
      CV77001
      CV87002

CLERICAL COMPOSITE (see COMPOSITE)

COAST GUARD SELECTION TEST
  CG81001

COGNITIVE COMPLEXITY
  CV87003

COGNITIVE TESTS
  AR83001
  AR83002
  NV84011

COMPOSITES
   AR79002
   AR83002
   AR83003
   MC78001

COMPOSITES (Continued)
MC82001
MC86001
NV84001
NV84009
ARMED FORCES QUALIFICATION TEST (AFQT)
AF70002
AF74001
AF76002
AF77001
AF77003
AF77007
AF78001
AF82001
AF85002
AF86001
AR74001
AR81001
AR81002
AR81004
AR82005
AR83001
AR84004
AR85001
AS69001
AS80002
AS82004
AS82005
AS83001
AS84001
AS84009
AS87001
AS88001
AS89001
CG81001
CV69001
CV80001
CV82001
CV84002
CV84003
CV84004
CV85002
CV86001
CV87004
CV87006
MC78001
MC78002
MC78003
MC81001
MC81003
MC82002
MC83002
MC86002
MC86005

COMPOSITES (Continued)
    ARMED FORCES QUALIFICATION TEST (AFQT)
        NV67001
        NV67002
        NV70001
        NV72001
        NV78001
        NV83003
        NV83006
        NV84002
        NV84005
        NV85002
    ALTERNATIVE
        MC86002
        AF86001
        AF70001
        AF70002
        AF76005
        AF77007
        AF86001
        AR85001
        AS69001
        AS82001
        AS82004
        AS84009
        AS87001
        AS88002
        AS89001
        CV69001
        CV71001
        CV80001
        CV84002
        CV85002
        CV87004
        CV88003
    APTITUDE
    INDEX
        AF68001
        AF70001
        AF73001
        AF74001
        AF76003
        AF77008
        AF81001
        AF84001
        AF84002
        AR78001
        AR82005
        AR83005
        AR84001
        AS88002
        CV87003
        CV88004

COMPOSITES (Continues)
PERFORMANCE
AF80001
AS86002
CV85002
REQUIREMENTS
AF84003
AF87004
AF88002
MC74001
STANDARDS
AF74002
AF77001
AF77007
AF84003
AF86001
AR69001
AR81004
AR83001
AR85001
AS69001
AS82001
AS82003
AS83001
AS83002
AS84001
AS84003
AS85002
AS85003
AS87001
AS89001
CV69001
CV84002
CV84003
CV84004
CV87003
CV87004
MC74001
MC81003
MC83001
MC84002
MC85002
MC86005
NV72001
NV83006
NV84002
NV84006
NV84010
NV85002
AS80002
NV84007
NV84008
NV84010

COMPOSITES (Continued)
HIGH SCHOOL
AF73001
AF76004
AF76006
AF76007
AR84001
AS82002
AS84009
CV80001
CV81002
CV87001
CV87002
CV88003
MC81001
MC82001
MC83001
MC84001
MC86006
SERVICE
AS82002
AR82006
AS84008
AS84009
AIR FORCE
AF74001
AF76001
AF76002
AF77001
AF77008
AF79001
AF81001
AF85002
AF88002
ARMY
AR81001
AR82002
AR83003
AR84001
AR84002
AR84005
AR84006
AR84007
MARINE CORPS
MC78001
MC78002
MC78003
MC82001
MC82002
MC83001
MC84001
NAVY
NV78001
NV79001

COMPOSITES (Continued)
    NAVY
        NV80001
        NV81002
        NV82002
        NV82003
        NV83007
        NV84001
        NV84005
        NV84006
        NV84008
        NV84009
        NV84010
        NV84011
        NV85001
        NV85002
        NV85003
        NV86001
        NV86002

COMPROMISE (see TEST, COMPROMISE)

COMPUTERIZED ADAPTIVE TESTING (CAT)
    AF82002
    AF86002
    NV83003

CONCURRENT VALIDATION (see VALIDITY, CONCURRENT)

CONSTRUCT VALIDITY (see VALIDITY, CONSTRUCT)

CORRELATION
    AF74001
    AF76004
    AF77004
    AF78001
    AR85001
    AS84009
    CV85003
    MC82002
    NV82004
    NV84001
    NV84005

COST AVOIDANCE
    AF77007

COURSE ATTRITION (see ATTRITION)

COVARIANCE ANALYSES
    AR84004

ENGLISH DIAGNOSTIC TEST (EDT)
    AF85001
    NV84001

ENLISTMENT STANDARDS (see COMPOSITE, APTITUDE; STANDARDS)

EQUATING (see also NORMING)
    AF76004
    AF85003

ETHNICITY (see SUBGROUP ANALYSIS)

EXPECTANCY ANALYSIS
    NV81002
    NV82002
    NV82003
    NV84001
    NV84005
    NV84010

FACTOR ANALYSIS
    AF76007
    AF77010
    AF85002
    AF88004
    AR79002
FACTOR ANALYSIS (Continued)
    AR82003
    AS84002
    CV81002
    CV84001
    CV85003
    CV88001
    CV88002
    CV88003
    MC78001
    MC78002
    MC83001
    MC83004
    NV83003

FINAL SCHOOL GRADE (see VALIDITY, CRITERION-RELATED)

FORECASTING
    AF87004

GENDER (see SUBGROUP ANALYSIS)

GENERAL APTITUDE TEST BATTERY (GATB)
    AF76004
    AF85002
    CV88001
    NV87001

GENERAL COGNITIVE ABILITY (g)
    AF85002
    CV84001

GENERAL EDUCATION DEGREE (GED)
    CV84003
    MC81003

GENERAL TECHNICAL COMPOSITE (see COMPOSITE, SERVICE)

HANDS-ON PERFORMANCE (see PERFORMANCE, MEASUREMENT)

HIERARCHICAL GROUPING
    AF88002

HIGH SCHOOL PROGRAM (see COMPOSITES, APTITUDE; and VALIDITY, HIGH
            SCHOOLS)

HOLLAND OCCUPATIONAL CODES
    CV87002

INTELLIGENCE
    AF74001
    AF77005
    CV88002
    CV88003

INTERCEPT BIAS (see SUBGROUP ANALYSIS)

INTEREST MEASUREMENT

ITEM RESPONSE THEORY (IRT)
    AF77004
    AF82001
    AF82002
    AF88003
    AF88004
    AR84003
    AS81002
    CG81001
    CV85003

JOB
    ANALYSIS
        AF76003
        AF80001
        AF83002
        AF84002
        AF84003
        AF87004
        AF88001
        AS82003
        AS85003
        AS86002

JOB COMPONENT VALIDITY
  CV77001

JOB CORPS TRAINEE
  AR82006

JOHNSON-NEYMAN TECHNIQUE
  NV83007

KAISER "LITTLE JIFFY" TECHNIQUE
  CV81002

LATENT TRAIT PARAMETERS
  AF82002

LINEAR MODEL
  AF77001
  AF82002
  AF83002
  MC85002
  NV70001

LINEAR TYPAL ANALYSIS
  AF76002

LITERACY
  AF77005
  AF78001
  AR81002
LITERACY (Continued)
  CV71001
  CV72001
  CV82001
  CV88004
  NV80002
  NV81001
  NV81002
  NV82004
  NV85003
  NV86002

LONGITUDINAL RESEARCH DATABASE (LRDB)
  AR83005

M-TECHNIQUE
  AF79001

MEDICAL TECHNICAL TRAINING
  AF77005

MENTAL ABILITY (see COMPOSITE, AFQT CATEGORIES)

MENTAL CATEGORY (see COMPOSITE, AFQT CATEGORIES)

META ANALYSIS
    AF85002
    AR83006
    CV84001
    CV88003
    NV87001

METROPOLITAN READING ACHIEVEMENT TEST
    AR81002

MILITARY EFFECTIVENESS
    NV67002

MILITARY ENLISTMENT STANDARDS (see COMPOSITES, APTITUDE; STANDARDS)

MILITARY EXPERIENCE (see JOB, EXPERIENCE; MILITARY)

MILITARY OCCUPATIONAL SPECIALTY (MOS) (see CLASSIFICATION,
                                                MILITARY OCCUPATIONS)

MILITARY SELECTION (see COMPOSITE, APTITUDE; STANDARDS)

MNEMONICS
    NV80002

MODERATOR VARIABLES EFFECTS
    CV86001

MORSE CODE TRAINING
    NV80002

MULTIPLE DISCRIMINANT FUNCTION ANALYSIS
    AF76002

MULTIPLE FACTOR MODEL
    CV85003

MULTIPLE REGRESSION (see REGRESSION, MULTIPLE)

MULTIPLEX CONTROLLER APTITUDE TEST
    AF87001

NATIONAL GUARD
    AS85002

NATIONAL LONGITUDINAL STUDY (see REFERENCE GROUP, 1980 AMERICAN
                                                YOUTH)

NAVY BASIC TEST BATTERY
    NV70001
    NV75001

NELSON-DENNY READING TEST
    AF76002

NON-HIGH SCHOOL GRADUATES (see VALIDITY, CRITERION-RELATED; HIGH
SCHOOL)

NON-PRIOR SERVICE (NPS) ENLISTEES (see COMPOSITE, APTITUDE;
STANDARDS)

NORMS (see POPULATION, NORMS)

NORMING
    AF68001
    AF75001
    AF76006
    AS80002
    AS84002
    CV84002
    CV85002
    CV80001
    MC86005
    NV84002

NUMERICAL SKILLS (see LITERACY)

OCCUPATION (see JOB)

OCCUPATIONAL ANALYSIS (see JOB, ANALYSIS)

OTIS-LENNON MENTAL ABILITY TEST
    AF77005

OWEN'S ADAPTIVE TESTING STRATEGY (see BAYESIAN, BAYESIAN ADAPTIVE
TEST)

PATH ANALYSIS
    AF85002
    CV84001

PEER RATINGS (see VALIDITY, CRITERION-RELATED; JOB PERFORMANCE
CRITERIA)

PERCENTILES
    AS80002

PERFORMANCE
    JOB (see VALIDITY, CRITERION-RELATED; JOB PERFORMANCE
        CRITERIA)
    MEASUREMENT
        AF70002
        AR80002
        AR83005
        AS82001
        AS85003
        AS86002
        AS87001

PERFORMANCE (Continued)
    MEASUREMENT
        AS89001
        MC84002
        MC86005
    MILITARY
        AF76002
        AF77008
        AF80001
        AF84002
        AR81001
        AR84005
        AR85001
        AS82003
        CV84003
        MC74001
        MC81001
        NV67001
        NV82002
        NV83005
        NV83006
        NV85001
        NV70001
        NV82004
        NV84006
        NV84009
    TASK (see VALIDITY, CRITERION-RELATED; JOB PERFORMANCE
        CRITERIA)
    TECHNICAL (see VALIDITY, CRITERION-RELATED; JOB PERFORMANCE
        CRITERIA)

PERSON JOB MATCH (see CLASSIFICATION, MILITARY OCCUPATIONS)
    AF83002

PHI-COEFFICIENT
    AF77004

POPULATION
      AF73001
    NORMS
      AF68001

POST-SECONDARY SCHOOLS
    AS82002

PREDICTION (see VALIDITY, CRITERION-RELATED (PREDICTIVE)

PROFILE OF AMERICAN YOUTH (see REFERENCE GROUP, 1980 AMERICAN
                YOUTH)

PROJECT 100,000
    AF70002
    CV69001
    CV71001

PROJECT 100,000 (Continued)
    CV72001
    CV85002
    CV87004
    NV67001

PROMOTION (see VALIDITY, CRITERION-RELATED)

PSYCHOMETRIC g (see GENERAL COGNITIVE ABILITY)

QUALIFICATION STANDARDS (see COMPOSITE, AFQT CATEGORIES AND
                    EDUCATIONAL LEVEL)

QUALITY INDICATORS (see COMPOSITE, AFQT CATEGORIES AND
                    EDUCATIONAL LEVEL)

R-TECHNIQUE
    AF79001

RADIO COMMUNICATIONS APTITUDE TEST (RCAT)
    NV82002

RATE OF LEARNING??
    CV69001

RECRUIT (see ALL VOLUNTEER FORCE)

REFERENCE GROUP
    1980 AMERICAN YOUTH
        AF76001
        AS82004
        AS84001
        CV87001
        CV87002
        MC83004
        MC86005

REGRESSION (see VALIDITY, CRITERION-RELATED (PREDICTIVE))
    MULTIPLE
        AF76001
        AF76003
        AF76004
        AF83002
        AF84003
        CV88001
        NV67001
        NV80001
        NV82003
        NV82004
        NV84001
    RIDGE
        AR84001

SELECTION
    AF72001
    AF76003
    AF76005
    AF76006
    AF77003
    AF77005
    AF77006
    AF78001
    AF81001
    AF82001
    AF85001
    AF87001
    AF88005
    AF88002
    AR80002
    AR81001
    AR82003
    AR83001
    AR83004
    AR83006
    AS82003
    AS84001
    CV82001
    CV88003
    MC81003
    MC82001
SELECTION (Continued)
    NV67001
    NV67002
    NV84001
    NV84002
    NV86001

SELF ESTIMATE (see VALIDITY, DIFFERENTIAL)

SELF PACED (see VALIDITY, CRITERION RELATED; SELF-PACED)

SENSITIVITY ANALYSIS
    CV87006
    MC86006

SERVICE EDUCATION STANDARDS (see COMPOSITE, APTITUDE; STANDARDS)

SKILL QUALIFICATION TEST (SQT)
    AF77004
    AR81001
    AR83001
    AR84001

SKILL QUALIFICATION TEST (SQT) (Continued)
    AR84002
    AR84006
    AR84007
    AR85001
    AS82005
    CV84002

SLOPE BIAS (see SUBGROUP ANALYSIS)

SPECIALTY KNOWLEDGE TEST (SKT)
    AF72001

STANDARDS (see COMPOSITE, APTITUDE; STANDARDS, also DEMOGRAPHICS
        PREDICTORS and DEMOGRAPHIC DIFFERENCES)

STANDARDIZATION (see NORMING)

STATISTICAL MODELS
    AS85002

SUBGROUP ANALYSES
        AF70001
        AF77007
        AF86001
        AS81002
        MC86002
        NV83007
    EDUCATION LEVEL
        AF77001
        AR82003
        MC81001
        MC84001
        MC86001
        NV75001
    ETHNICITY
        AF70001
        AF70002
        AF72001
        AF74001
        AR78001
        AR84002
        AR84003
        AS81002
        AS84008
        AS84009
        CV80001
        MC81001
        MC85002
        NV72001
        NV75001
        NV83007
        NV84005

SUBGROUP ANALYSES (Continued)
GENDER
AF76004
AF76007
AF77001
AR82003
AR83003
AR84002
AR84003
AS81002
AS84008
AS84009
MC84001
MC85002
MC86001
NV84005

SUBTEST (see VALIDITY, CRITERION-RELATED(PREDICTIVE); SUBTEST)

SUPERVISORY RATINGS (see VALIDITY, CRITERION-RELATED)

SUPPLEMENTARY CRITERION MEASURES
NV84008

TACIT KNOWLEDGE TEST
CV88002

TAILORED TESTING (see TESTS, ADAPTIVE)

TEST BIAS (see SUBGROUP ANALYSIS)

TEST COMPROMISE
AF86001
AS80002
MC78003

TESTS
ADAPTIVE
AF73001
AF76001
AF77004
AF82002
AF84002
AR80001
AR81002
AR82003
AR85001
AS84008
MC84002
NV83003
CONSTRUCTION
AF68001
AF76004
AF76007

TEST (Continued)
    CONSTRUCTION
        AF77003
        AF82001
        AF82003
        AF85003
        AF86001
        AF88005
        AF88004
        AR80001
        AR83004
        CV77001
        CV86001
        CV88004
        NV78001
        NV84009
        NV85001
        NV86001
    NON-VERBAL
        AF76005

TRAINING
        AF77005
        AF80001
        AF84002
        AF84003
        AF87004
        AR69001
        AR72001
        AR81001
        AR82005
        AR83001
TRAINING (Continued)
        AR84001
        AR84004
        AR84007
        AS69001
        AS82003
        AS82005
        CV69001
        CV80002
        CV88003
        MC81001
        MC81003
        MC83001
        MC85002
        MC86001
        MC86006
        NV78001
        NV79001
        NV80002
        NV81001
        NV81002
        NV82003

TESTS (Continued)
    FINAL SCHOOL GRADE
        NV82004
        NV84005
        AF70001
        AF73001
        AF77010
        MC85002
        NV70001
        NV72001
        NV79001
        NV81002
        NV82002
        NV82003
        NV82004
        NV84005
        NV84006
        NV84007
        NV84008
        NV84010
        NV84011

TRUNCATION (see RANGE RESTRICTION)

UNIQUE FACTORS (see FACTOR ANALYSIS)

UNIQUE VALIDITY (see VALIDITY, UNIQUE)

UNSUITABILITY DISCHARGE (see VALIDITY, CRITERION-RELATED)

UTILITY ANALYSIS
    AR83003
    NV84002

VALIDITY
    CONCURRENT
        CV87001
        NV78001
    CONSTRUCT
        AF86002
        AS82002
        CV84001
        CV88001
        MC83004
    CONTENT
    CRITERION-RELATED (PREDICTIVE)
            AF72001
            AF74001
            AF74002
            AF76002
            AF76004
            AF77001
            AF77004
            AF77005

VALIDITY (Continuted)
 CRITERION-RELATED (PREDICTIVE)
  AF77008
  AF79001
  AF81001
  AF82002
  AF85001
  AR69001
  AR74001
  AR81004
  AR83002
  AR83003
  AR83005
  AR84001
  AR84004
  AR85001
  AS69001
  AS82002
  AS82003
  CG81001
  CV72001
  CV80001
  CV87001
  CV88001
  CV88002
  MC74001
  MC81001
  MC82001
  MC83001
  MC83002
  MC84001
  MC85001
  MC85002
  MC86001
  MC86002
  NV67001
  NV67002
  NV72001
  NV78001
  NV79001
  NV81002
  NV83007
  NV84002
  NV84003
  NV84005
  NV84006
  NV84007
  NV84010
  NV87001
 JOB PERFORMANCE CRITERIA
  AF70002
  AF72001
  AF76002
  AF77001

135

VALIDITY (Continuted)
    JOB PERFORMANCE CRITERIA
        AF77004
        AF77008
        AF77010
        AF80001
VALIDITY, CRITERION-RELATED (PREDICTIVE) (Continued)
    JOB PERFORMANCE CRITERIA
        AF82002
        AF84001
        AF84002
        AF84003
        AF85002
        AR81001
        AR81004
        AS82001
        AS82003
        AS82005
        AS83001
        AS84003
        AS85003
        AS86002
        AS87001
        AS88001
        AS88002
        AS89001
        CV69001
        CV71001
        CV72001
        CV80002
        CV84001
        CV84002
        MC74001
        MC84002
        MC85001
        NV72001
        NV84003
      SELF-PACED
        AF76002
        AF77008
        NV80002
    HIGH SCHOOL
      MC86006
    SUBTEST
      AF81001
      MC82001
      MC83001
      MC83002
      MC86002
    TRAINING CRITERIA
        AR78001
        AS69001
        CV88001

VALIDITY, CRITERION-RELATED (PREDICTIVE) (Continued)
    DIFFERENTIAL
        AF85002
        AR78001
        AR83003
        AR84001
        AR84005
        CV87001
        CV87002
VALIDITY, CRITERION-RELATED (Continued)
    DIFFERENTIAL
        MC78002
        MC81001
        MC83002
        NV75001
        NV83007
    UNIQUE
        MC86002

VARIMAX ROTATION (see FACTOR ANALYSIS)

VISUAL REACTION TIME
    NV80002

VOCATIONAL (see JOB, VOCATIONAL)

WESCHLER ADULT INTELLIGENCE SCALE (WAIS)
    AF74001

WEIGHTED AIRMAN PROMOTION SYSTEM (WAPS)
    AF72001

WILKS' LAMBDA CRITERION
    AF76002